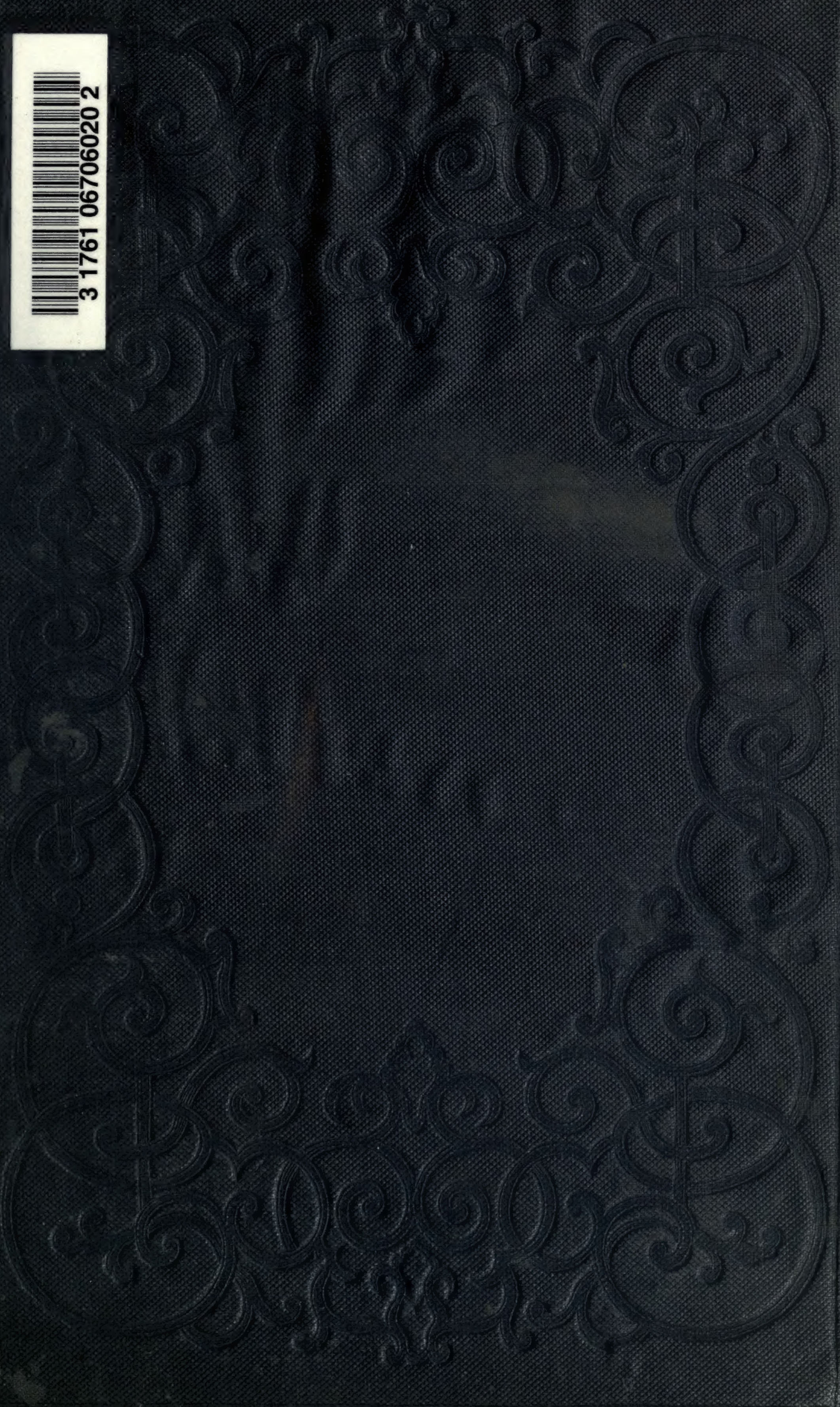

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WITH CORRECTIONS AND ADDITIONS,

SO AS TO RENDER IT SUITABLE TO THIS COUNTRY, AND BRING IT DOWN TO THE PRESENT TIME.

WITH

DISSERTATIONS

ON THE RISE AND PROGRESS OF LITERATURE,
BY SIR D. K. SANDFORD, A.M. OXON., D.C.L.

ON THE PROGRESS OF SCIENCE,
BY THOMAS THOMSON, M.D., F.R.S.L. & E., &c. &c.

AND

ON THE PROGRESS OF THE FINE ARTS,
BY ALLAN CUNNINGHAM, ESQ.

VOLUME VII.—PART II.

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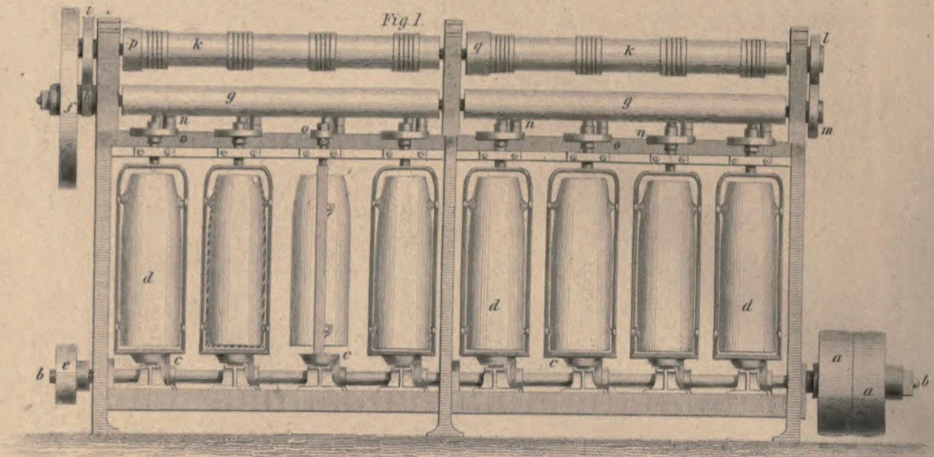
ROPE MAKING.

PLATE LXXIV.

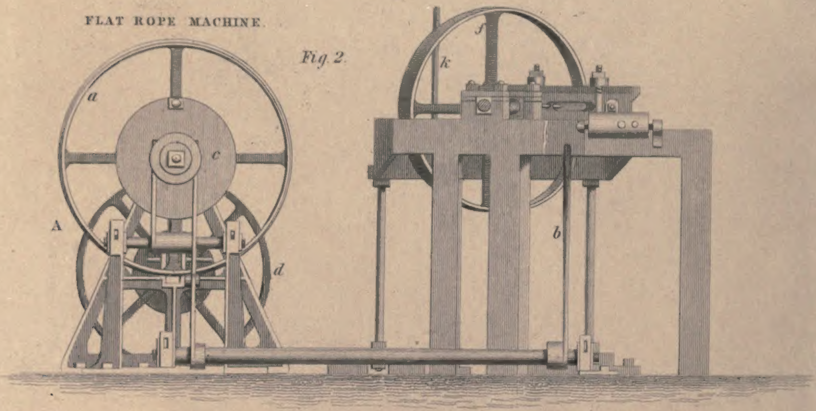
TWISTING MACHINE

Fig. 1.



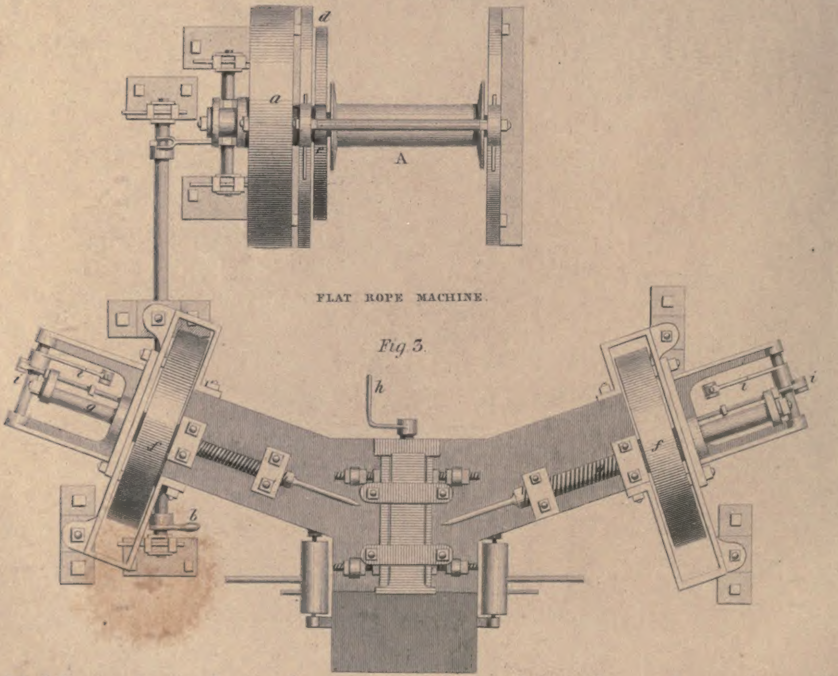
FLAT ROPE MACHINE.

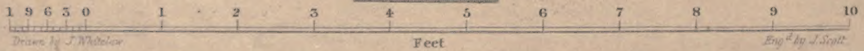
Fig. 2.



FLAT ROPE MACHINE.

Fig. 3.





Drawn by J. Whitelaw

Eng^d by J. Scott.

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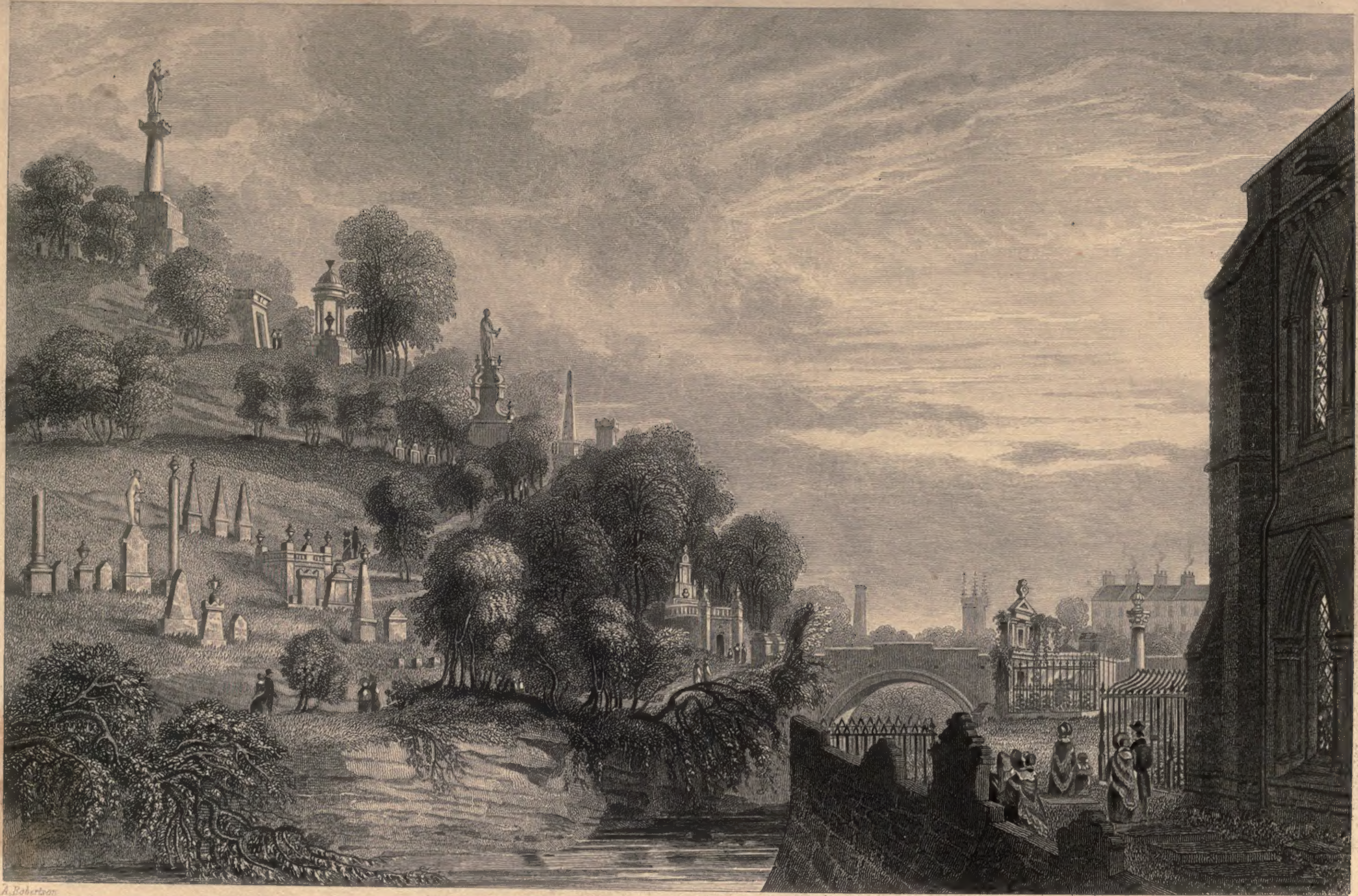


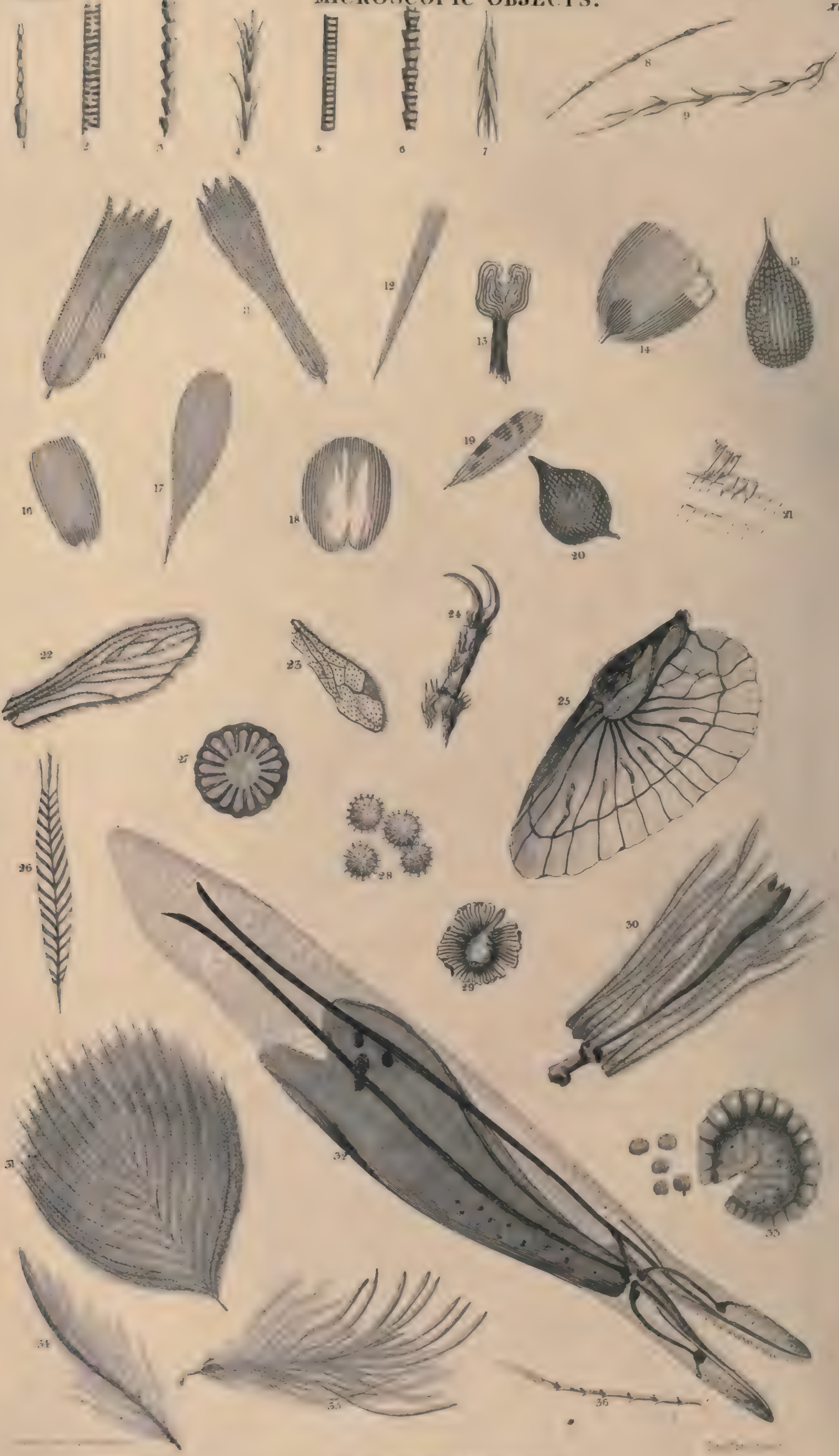
A. Robertson

J. Watt

NECROPOLIS AT GLASGOW.

Blackie & Son, Glasgow.

MICROSCOPIC OBJECTS.



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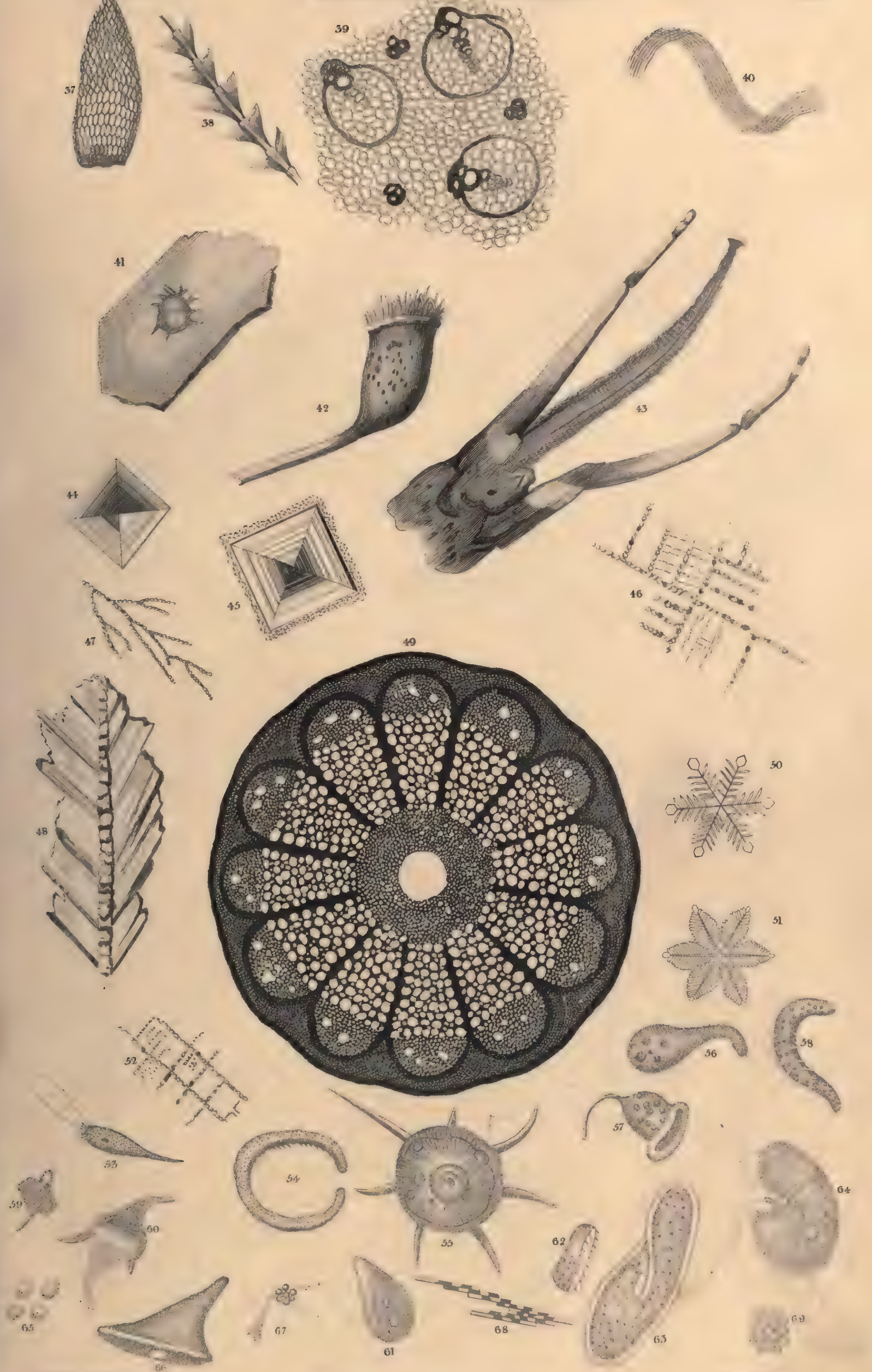
MICROSCOPIC OBJECTS.



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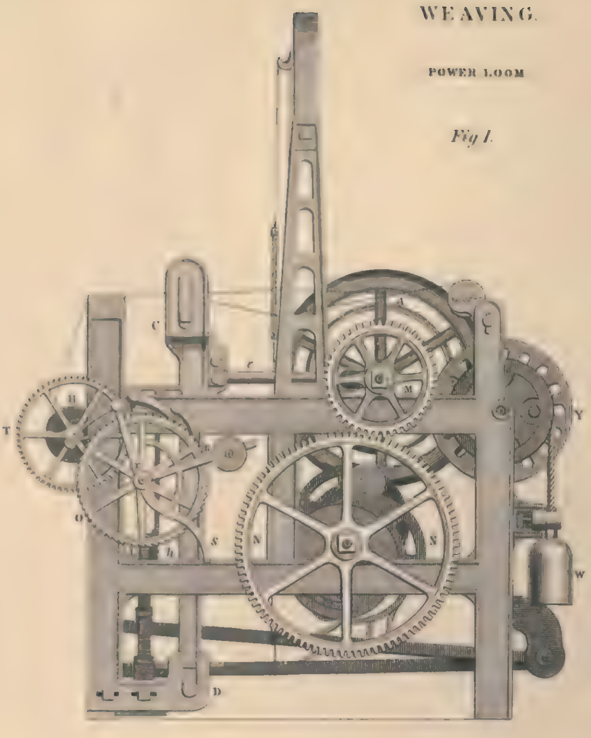
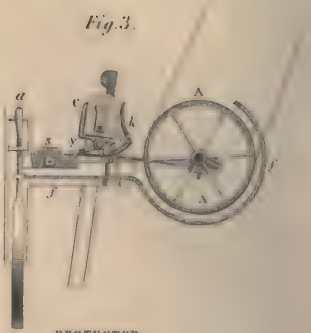
POWER LOOM

Fig 1.



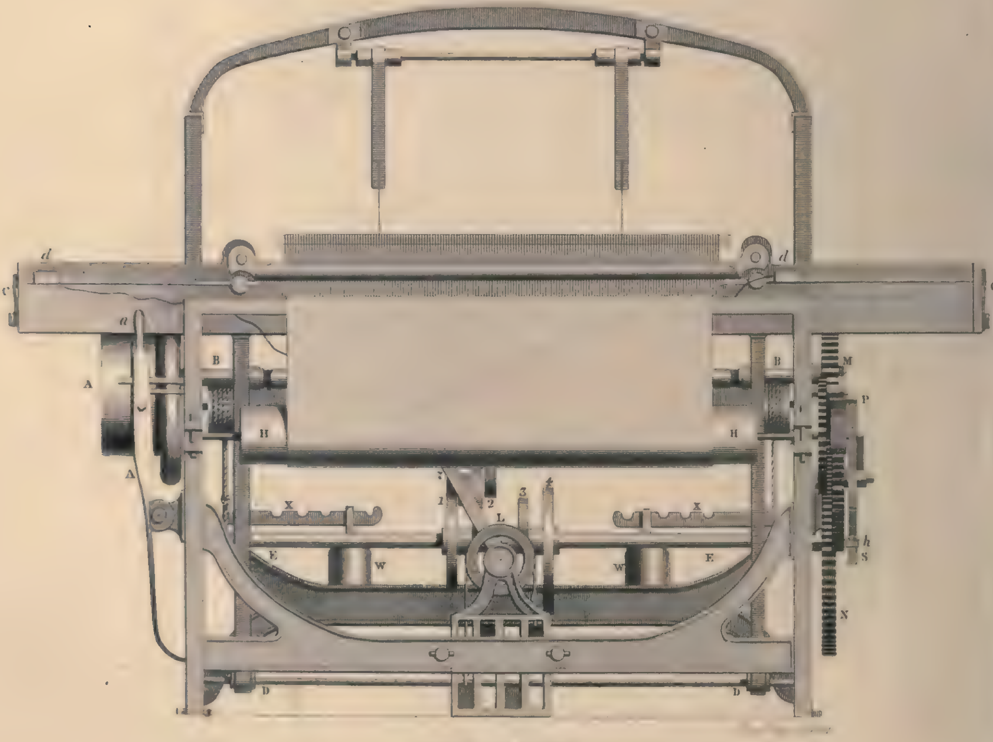
END ELEVATION.

Fig.3.



PROTECTOR.

Fig.2.



FRONT ELEVATION

[illegible] by Blackie & Son Glasgow

WEAVING.

JACQUARD LOOM

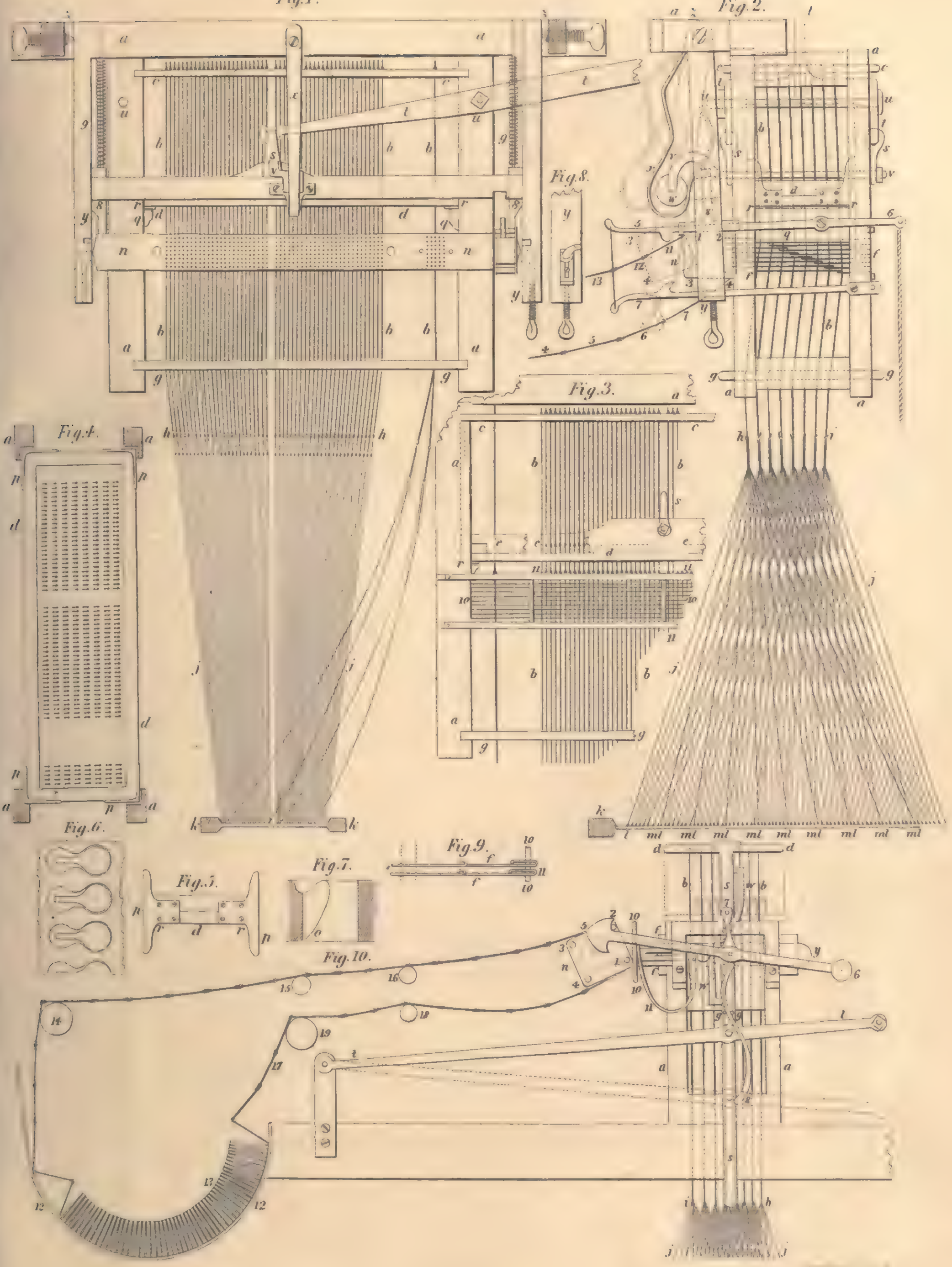


Fig.1.
a a b b b b c c d d g g h h j j k k n n q q r r s t t u u v x y y 8 8 9 9
Fig.2.
a a a a b b c d f g g h j k l ml ml ml ml ml ml ml ml ml q r r s s t t u u v v w x y 1 2 3 3 4 4 5 5 6 6 7 7 11 12 13
Fig.3.
a a a b b b b c c d e e e g g r s 10 10 11 11 11
Fig.4.
a a a a d d p p p p
Fig.5.
d p p r r
Fig.6.
Fig.7.
o
Fig.8.
y y
Fig.9.
f f 10 10 11
Fig.10.
a a b b d d f f g h i j j l n s s t w y 1 2 3 4 5 6 7 8 10 10 11 12 12 13 14 15 16 17 18 19

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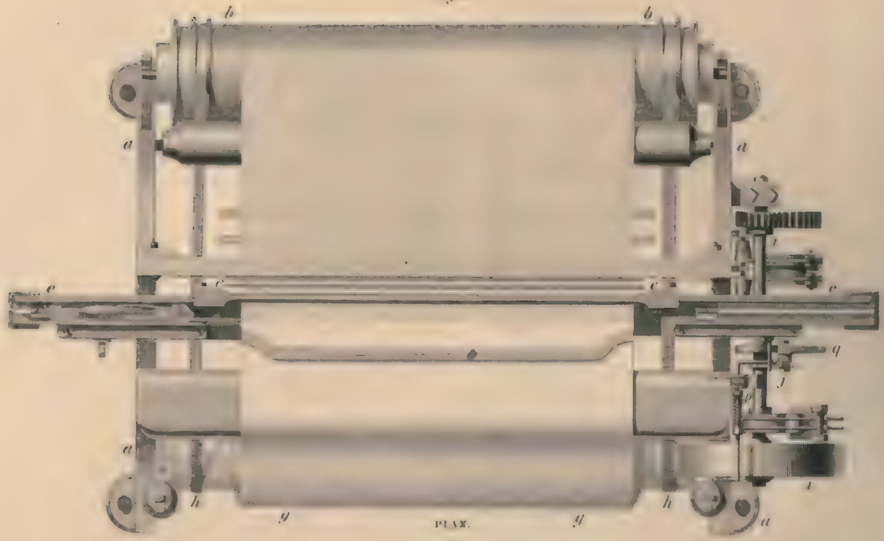
WEAVING

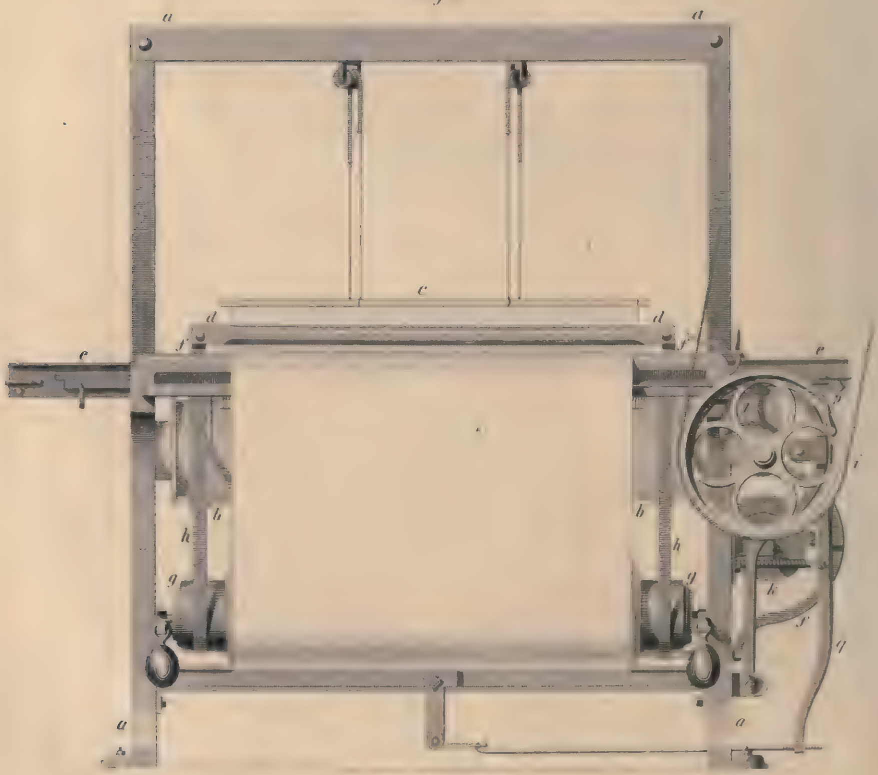
IMPROVED POWER LOOM

Fig 2



PLAN.

Fig. 1



FRONT ELEVATION.

[illegible]

[illegible]

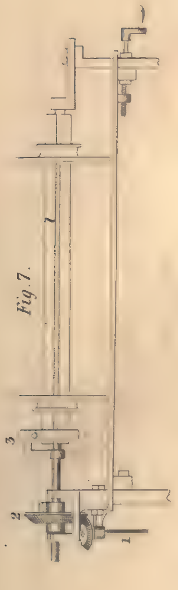


Fig. 7.

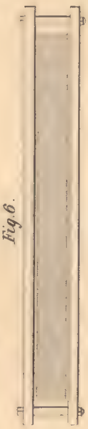


Fig. 6.

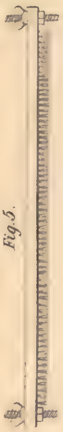


Fig. 5.

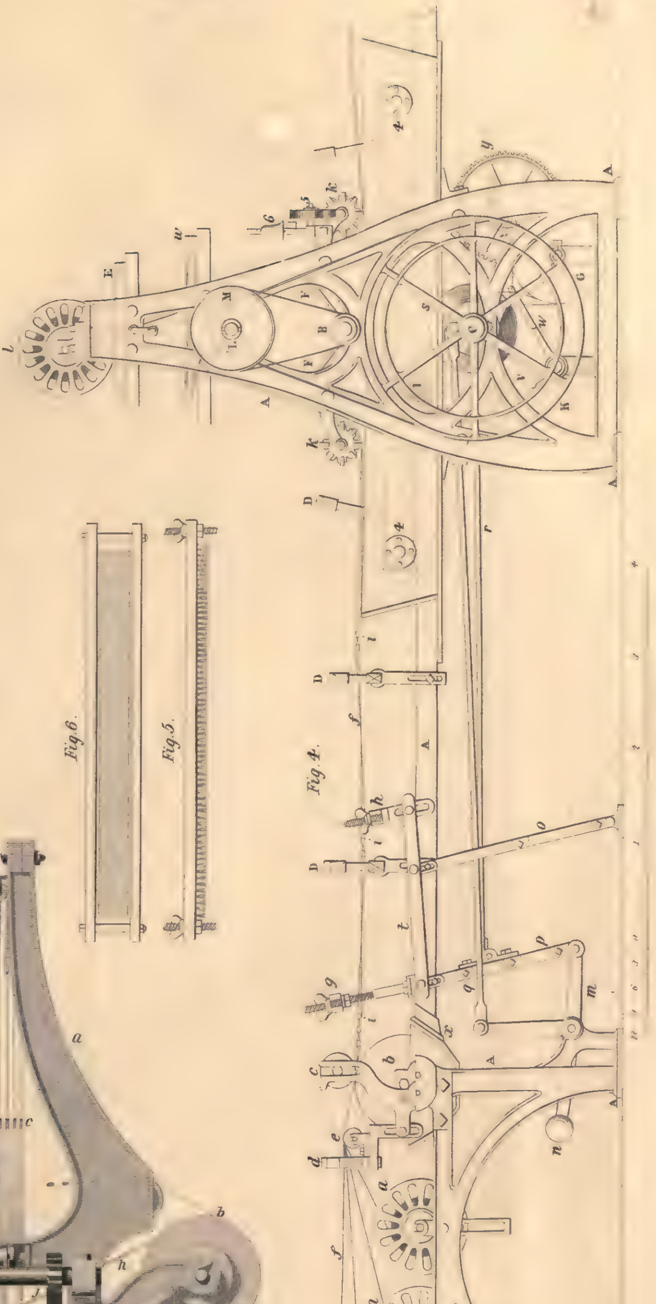
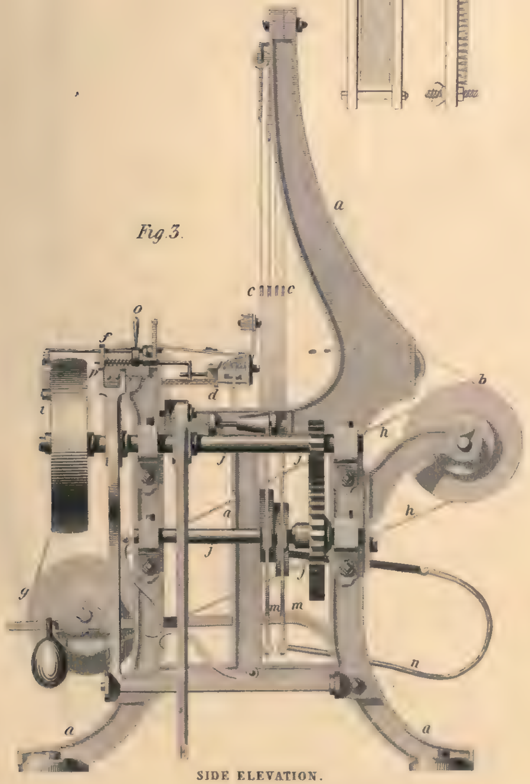


Fig. 4.

DRESSING MACHINE LONGITUDINAL VIEW.

Fig. 3.



SIDE ELEVATION.

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DUNDEE, (*a*.) Some of the more recent improvements which have taken place in this thriving town may be here noticed. Reform street, since our former article was written, has been opened up between the High street and the Meadows, and when finished, will embrace a range of street architecture scarcely equalled by any thing of the kind in Scotland. The ancient town-house stands opposite its southern extremity, and the new public seminaries cover its northern termination. This splendid building is in the Doric style of Greek architecture. The portico is composed of eight columns, resembling those of the Parthenon at Athens, but only two-thirds the size. The infusion of a stream of pure air into the very heart of the town is none of the least benefits arising from the construction of Reform street. A fine new street, named Lindsay street after a late provost, has also been opened, along which the line of the Newtyle Railway passes across the Overgate and Nethergate towards the harbour. Immediately adjoining the Railway depôt at the ward, stands the extensive and commodious new gaol and bridewell, on the erection of which about £20,000 has been expended;—the new burying ground, embracing an extent of above four acres, beautifully laid out and embellished with shrubbery, lies to the eastward, and on an eminence to the north the new bleaching green,—the improvements in this quarter comprising the most picturesque approach to the town, and a number of the finest new buildings in or around it. The extension of Union street south to the Craig Pier, the great landing place from the south through Fife, will soon secure a becoming approach to the town from that quarter. But the greatest street improvement in recent times is the opening up of Panmure street between the Cowgate and the Meadows, terminating at the top of Reform street,—thus becoming the great thoroughfare from the eastward, and avoiding the narrow of the Murraygate.

The harbour has long been considered, and justly so, as the noblest specimen of the spirit and enterprise of the inhabitants. Up to May, 1839, no less a sum than £447,248 has been expended on the works, which are not yet completed,—being an increase of £181,563 during the last six years. Two commodious wet-docks have been finished for several years, and the construction of a third, which is nearly completed, and contains a greater area than any single dock in the kingdom, will afford a greater extent of harbour accommodation than any port in Britain. The newly constructed line of railway between Dundee and Arbroath, which is considered one of the most beautiful yet in operation, passes along the northern boundary of the docks,—affording, in conjunction with the Newtyle and Forfar railways, a cheap and rapid communication with Strathmore. The projected line of railway between Dundee and Perth seems to be abandoned for the present. Dock street is in the course of being extended eastward to Carolina port, and when completed will exhibit a noble line of quay, upwards of a mile in length, unequalled in the kingdom. Government has lately given £9000, besides purchasing ground for the erection of a custom house and excise office in Dock street, in a style commensurate with the rapidly increasing trade of the port, which will soon embrace a direct trade with the East Indies. In addition to the capacious graving dock, an excellent patent slip, on Morton's principle, has recently been constructed, capable of taking up the largest merchant vessels, and a powerful crane has been erected at the south of Earl Grey's dock.

Notwithstanding the check which the trade of Dundee, in common with that of other towns, has recently suffered, the imports and exports have been gradually augmenting from 1833 to 1839. An abstract of these for the year ending 1833 shows an increase almost wonderful. Flax and flax codilla imported, 18,777 tons; and hemp and hemp codilla, 3,380; while 515,206 pieces linens, sailcloth, bagging, &c., were exported, measuring upwards of 57½ millions of yards. But a still greater gradual increase subsequently took place; for in the year ending May, 1839, the importation of flax and flax codilla reached 28,973 tons, hemp and hemp codilla, 3,489 tons; the exportation for the same period being 717,070 pieces linens, sail-cloth, bagging, &c. This affords a striking contrast to the year 1745, when only 74 tons of flax were imported, and 7,000 pieces of linens exported. There has been a corresponding increase in arrivals from foreign ports. During the year ending May 1833, vessels embracing 47,148 tons register arrived, and for the year ending May 1839 the tonnage amounted to 65,220. The shore dues, too, with the exception of a single year, bear out the gradual increase: for the years ending May 1833, to May 1839, both inclusive, the amount collected was progressively as follows:—£9,229, £9,993, £10,935, £12,774, £15,597, £13,262, and £16,004. The shipping belonging to the port has also greatly increased during these six years. At the end of 1833, the tonnage reached 36,473, while its present amount is upwards of 45,000. In 1820 about eighty horse power was employed in Dundee in spinning yarns. The present amount of steam power for spinning and weaving, in and about the town, is estimated at 17,000 horse power. Fully 700 has been erected since the beginning of 1834, but owing to the recent adverse state of trade, more than that amount has been thrown out of employment at present. The population has also increased rapidly within these few years. In 1831, Dundee contained 43,355 inhabitants exclusive of the seamen belonging to the port, and in 1841, the population amounted to 62,794.

Imports and Exports of Dundee for the Year ending 31st May, 1839.

IMPORTS.

Flax,	21,237	tons.
— Codilla,	7.646	—
Hemp,	2,677	—
— Codilla,	812	—
Lime,	59,377	bolls.
Coals, English,	71,358	—
— Scotch,	86,891	—
Ashes,	1,239	cwts.
Timber,	11,890	loads.
Iron,	8,095	tons.
Tallow,	123	cwts.
Tar.	476	barrels.
Whale Blubber,	783	tons.
— Bone,	900	cwts.,
Wheat,	17,591	qrs.,
Salmon,	4,227	boxes.

EXPORTS.

Osnaburgs,	79 691	pieces.
Sheetings,	209,236	—
Cotton bagging,	35,164	—
Sundries, do.,	20,462	—
Sailcloth,	159,656	—
Sacking,	115,533	—
Dowlas	75,082	—
Sundries,	22,245	—
Wheat,	818	qrs.
Barley,	14,647	—
Oats,	112	—
Pease,	150	—
Flour,	5	sacks.

Estimated Value of the Principal Articles Imported and Exported at Dundee, during each year, from 1st June, 1835, to 31st May, 1838.

			Year ended 31st May, 1836.			Year ended 31st May, 1837.			Year ended 31st May, 1838.			Total Quantities.	Total Value.	Average Quantities.	Average Value.	Average Prices.		
			Quantity.	Price.	Value.	Quantity.	Price.	Value.	Quantity.	Price.	Value.							
					£			£			£		£		£	£	s.	d.
IMPORTS.	Flax	tons	16,629	46*l.*	764,934	22,461	36*l.*	808,596	13,624	35*l.*	476,840	52,714	2,050,370	17,571	683,456	39	0	0
	—— Codilla	do.	5,393	27*l.*	145,611	8,279	20*l.*	165,580	3,784	18*l.*	68,112	17,456	379,303	5,818	126,434	21	13	4
	Hemp	do.	6,213	23*l.*	142,899	1,768	30*l.*	53,040	1,490	30*l.*	44,700	9,471	240,639	3,157	80,213	27	13	4
	—— Codilla	do.	1,330	18*l.*	23,940	1,641	20*l.*	32,820	811	20*l.*	16,220	3,782	72,980	1,260	24,326	19	6	8
	Lime	bolls	71,680	3*s.* 6*d.*	12,544	67,811	3*s.* 6*d.*	11,877	52,097	3*s.* 6*d.*	9,117	101,588	33,538	63,862	11,179	0	3	6
	Coals, English	do.	163,667	4*s.* 6*d.*	36,825	308,436	4*s.*	61,687	281,991	4*s.*	56,398	754,094	154,910	251,364	51,636	0	4	2
	—— Scotch	do.	290,623	4*s.*	58,125	220,625	4*s.*	44,125	184,329	4*s.*	36,866	695,577	139,116	231,859	46,372	0	4	0
	Ashes	cwts.	14,787	30*s.*	22,180	10,047	30*s.*	15,070	7,153	30*s.*	10,729	31,987	47,979	10,662	15,993	1	10	0
	Timber	loads	13,724	5*l.*	68,620	11,630	4*l.* 10*s.*	52,335	7,253	4*l.* 10*s.*	32,638	32,607	153,593	10,869	51,197	4	13	4
	Iron	tons	3,984	10*l.*	39,840	4,244	12*l.* 10*s.*	33,050	6,240	12*l.* 10*s.*	78,000	14,468	170,890	4,822	56,963	11	13	4
	Tallow	cwts.	300	2*l.*	600	458	38*s.*	870	217	38*s.*	412	975	1,882	325	627	1	18	8
	Tar	barrels	100	14*s.*	70	2,438	15*s.*	1,828	1,000	15*s.*	750	3,538	2,648	1,179	882	0	14	8
	Whale Blubber	tuns	321	20*l.*	6,420	205	36*l.*	7,380	197	36*l.*	7,092	723	20,892	241	6,964	30	13	4
	—— Bone	cwts.	336	8*l.*	2,688	219	11*l.* 10*s.*	2,518	203	13*l.*	2,639	758	7,845	252	2,615	10	16	8
	Wheat	qrs.	14,678	2*l.*	29,356	11,790	2*l.*	23,580	13,052	2*l.* 10*s.*	32,630	39,520	85,566	13,173	28,522	2	3	4
	Salmon	boxes	1,660	5*l.*	8,300	4,160	5*l.*	20,800	5,188	5*l.*	25,940	11,008	55,040	3,669	18,346	5	0	0
					1,362,952			1,355,156			899,083		3,617,191		1,205,730			
					£			£			£		£		£	£	s.	d.
EXPORTS.	Osnaburgs	pieces	106,227	46*s.*	244,322	66,724	40*s.*	133,448	72,952	38*s.*	138,608	245,903	516,378	81,967	172,126	2	1	4
	Sheetings	do.	184,327	50*s.*	460,818	188,386	50*s.*	470,965	195,375	48*s.*	468,900	568,088	1,400,683	189,362	466,894	2	9	4
	Cotton Bagging	do.	159,494	48*s.*	382,785	79,649	40*s.*	159,298	23,216	35*s.*	40,628	262,359	582,711	87,453	194,237	2	1	0
	Sundry ditto	do.	21,841	45*s.*	49,142	20,193	40*s.*	40,386	14,576	35*s.*	25,508	56,610	115,036	18,870	38,345	2	0	0
	Sail Cloth	do.	99,805	30*s.*	149,708	125,496	28*s.*	175,694	121,004	27*s.*	163,355	346,305	488,757	115,435	162,919	1	8	4
	Sacking	do.	60,369	45*s.*	135,830	72,126	30*s.*	108,189	90,903	30*s.*	136,354	223,398	380,373	74,466	126,791	1	15	0
	Dowlas	do.	63,262	60*s.*	189,786	72,615	45*s.*	163,384	79,511	42*s.*	166,973	215,388	520,143	71,796	173,381	2	9	0
	Sundries	do.	15,619	50*s.*	39,048	16,749	40*s.*	33,498	16,171	40*s.*	32,342	48,539	104,888	16,179	34,962	2	3	4
	Wheat	qrs.	288	37*s.*	532	788	63*s.*	2,482	275	61*s.*	838	1,351	3,853	450	1,234	2	13	8
	Barley	do.	32,719	28*s.*	45,806	24,130	27*s.* 6*d.*	33,178	24,220	33*s.*	39,963	81,069	118,948	27,023	39,649	1	9	6
	Oats	do.	427	23*s.*	491	123	22*s.* 6*d.*	138	200	25*s.*	250	750	879	250	293	1	3	6
	Peas	do.	354	28*s.*	495	25	29*s.*	36	182	41*s.*	373	561	904	187	301	1	12	8
	Flour	sacks	21	34*s.*	35	114	50*s.*	285	40	50*s.*	100	175	420	58	140	2	4	8
					1,698,800			1,320,982			1,214,194		4,233,977		1,411,325			

DUNDONALD, Earl of. The right hon. Archibald Cochrane, ninth Earl of Dundonald, lord Cochrane of Paisley and Ochiltree, lord Cochrane of Dundonald, and a baronet of Nova Scotia, was born on the 1st Jan. 1748-9. The noble family of which he was the representative took its surname from the barony of Cochrane, in Renfrewshire, where it appears to have been of great antiquity. Although his ancestors did not attain the dignity of the peerage until the reign of Charles I. yet they had been barons of some distinction for many centuries before. William Cochrane, a chieftain who in his time possessed considerable power and renown, left but one child, Elizabeth, who married Alexander Blair (the proper family name at this day); and by him had seven sons. William, the second of these, was created baron Cochrane of Dundonald, in 1647, by Charles I.; and was advanced to the dignity of Earl of Dundonald, in 1669, by Charles II. From his eldest son descended seven Earls of Dundonald; but that branch became extinct in 1758, by the demise of William, a bachelor, who was killed at the capture of cape Breton. The honours and estates then devolved on Thomas, the father of the late peer; he being descended from John the younger son of the first earl. The late earl was the second but eldest surviving son of Thomas, by his second wife Jean, eldest daughter of Archibald Stewart, of Torrence, in the county of Lanark, Esq.; which lady lived to the age of eighty-six, and died in 1808. In 1764, his lordship obtained a coronet's commission in the 3d regiment of dragoons. He soon, however, quitted the army for the navy, and served as a midshipman under one of his countrymen, the late captain Stair Douglas, a gallant officer of the old school. He was afterwards stationed on board a vessel on the coast of Guinea as an acting lieutenant. On the demise of his father, which took place on the 27th of June, 1778, lord Cochrane succeeded to the family titles. He then determined to devote himself entirely to scientific pursuits, with the laudable view of improving the manufactures and commerce of his country. One of the first inventions published by this nobleman was intimately connected with the safety of the British navy, the extension of our mercantile speculations, and the advantage of the great proprietors of estates in the northern portion of the kingdom. While on the coast of Africa, he had perceived that both king's ships and merchant vessels were subject to be worm-eaten in a very short space of time; instances, indeed, having occurred in some of the great rivers, in which, in the course of a few months, they were declared not to be "sea-worthy." To remedy such an evil became a particular object of lord Dundonald's study; and he at last hit upon an expedient which promised to be attended with the most brilliant success, both in a national and in a profitable point of view. It was his lordship's opinion that an extract from coal, in the shape of tar, would prove effectual to the end proposed; and, after a variety of trials, it was at length found to answer. By way of a final experiment, an application was made to the states-general, and a guard-ship stationed at the mouth of the Texel had her bottom "payed" with this material. On her return into port, the keel, and all the streaks below watermark, were found to be sound and substantial. A certificate of the fact was granted; and a similar trial was made on a decked boat stationed at the Nore, the result of which was equally satisfactory. As the small or refuse coals were as good as the best for the purpose, warehouses and proper buildings for carrying on the process were erected at Newcastle; and in 1785, his lordship obtained an act of parliament for vesting in him and his assigns, for twenty years, the sole use and property of a method of extracting tar, pitch, essential oils, volatile alkali, mineral acids, salts, and cinders, from pit-coal, throughout his majesty's dominions; for which he had previously procured a patent for the usual short term. The general adoption of copper sheathing, however, rendered the speculation abortive; the use of coal tar was confined to the covering of outhouses, sheds, and fences; and lord Dundonald not only reaped no profit whatever from his invention, but sustained an extensive loss by it. In 1785, his lordship circulated "An Account of the Qualities and Uses of Coal-tar and Coal-varnish;" and in the same year he also published a quarto pamphlet, entitled "The present State of the Manufacture of Salt explained;" in which he recommended the refuse as a manure. In 1795, he published "A Treatise, showing the intimate connection that subsists between Agriculture and Chemistry; addressed to the Cultivators of the Soil, to the Proprietors of the Fens and Mosses in Great Britain and Ireland, and to the Proprietors of West India Estates;" and in 1799, "The Principles of Chemistry applied to the Improvement of the Practice of Agriculture." In 1801, his lordship obtained a patent "for a method of preparing a substitute for gum Senegal and other gums extensively employed in certain branches of manufacture." His preparation was to be formed from lichens, from hemp or flax, and the bark of the willow and lime. In 1803, he received another patent "for methods of preparing hemp and flax, so as materially to aid the operation of the tools called hackles, in the division of the fibre." This plan consisted in steeping or boiling the stalks, in order more effectually to remove the bark before dressing; and, as it was found to lessen the danger of mildew in sail-cloth, it was more generally adopted, although it did not prove more profitable than lord Dundonald's other inventions. His latter years were spent under great pecuniary embarrassments. He was at length relieved from them by death. His decease took place at Paris, on the 1st of July, 1831.

The earl of Dundonald was thrice married: first at Annsfield, October 17, 1774, to Anne, second daughter of captain James Gilchrist, R.N., of that place; and by that lady had one daughter and six sons: 1. The right hon. Thomas, now earl of Dundonald, born in 1775, who from his adventurous spirit has made the name of lord Cochrane familiar in almost every quarter of the world; he married, 1813, Catherine Frances Corbet, daughter of Mr Thomas Barnes, and has several children; 2. Lady Anne, and 3. The hon. James, who both died young; 4. The hon. Basil Cochrane, lieutenant-colonel of the 36th foot, who died May 14, 1816; 5. The hon. William Erskine Cochrane, a major in the army, and late of the 15th regiment of dragoons; 6. The hon. Archibald Cochrane, captain R.N.; 7. The hon. Charles, who died young. The first countess having died at Brompton, November 13, 1784, the earl married, secondly, at London, April 12, 1788, Isabella, widow of John Mayne, of Teffont-Ewias in Wiltshire, Esq., and daughter of Samuel Raymond, of Belchamp hall in Essex; and by her, who died in December, 1808, at the house of her brother, Samuel Raymond, Esq., had no issue; thirdly, in April, 1819, Anna Maria, eldest daughter of Francis Plowden, Esq. LL. D., the Irish historian, who died September 18, 1822, leaving an only child, the hon. Dorothy Cochrane, so named after her maternal grandmother, who was the authoress of an opera entitled "Virginius."

DUNLOH CASTLE, in the county of Kerry, Ireland, the remnant of an ancient fortress, which seems to have been originally erected for the purpose of guarding the river Laune, which is the only outlet of the lakes of Killarney. It stands on the summit of a small conical hill, whose apex has been cut away to afford a more convenient space for building; and its position must have rendered it, until the introduction of cannon into modern warfare, a place of great strength. It suffered considerably in the wars of the earl of Desmond, during the reigns of Henry VIII. and queen Elizabeth; but it was rebuilt about the period of Sir George Carew's administration in Munster. Subsequently, when the forces of the parliament came into this part of Ireland, the castle was again attacked, and a great part of it demolished by a bombardment. The only part of the edifice now standing is a square tower, which constituted but a small portion of the original fabric; this has been converted into a dwelling-house, "which affords more room and convenience than could be expected from the exterior aspect." Owing to the extraordinary thickness of the woods covering the hill upon which the building stands, no part of the lake or of the surrounding country is seen from the area in front of the castle, and even the windows afford but a very confined view; the battlements, however, command a noble prospect of the lake Killarney and of the windings of the river Laune.

The defile, which lies between Tomies Mountains and Macgillicuddy's Reeks, is called the Gap of Dunloh. The entrance is formed by the Holly mountain and the Bull mountain, which are shoots from the two larger masses above mentioned. Amidst the vast mountainous region on the western side of the county of Kerry, there is no scene which exhibits a more varied and sublime combination of the boldest features of uncultivated nature than the Gap of Dunloh.

DUNLUCE; a parish in the county of Antrim, Ireland, containing 3381 inhabitants. It is six miles N.N.E. from Coleraine, and one and a half from the Giant's Causeway. The land is generally fertile and well cultivated. There are extensive lime works and quarries of basalt within the parish; also a large paper manufactory.

Dunluce castle is a very extensive ruin, situated on a steep rock on the northern coast of the county. The rock on which it stands is completely covered with the buildings, so that the outer walls are flush with the face of the precipice. The rock itself is not surrounded by water, but is connected with the main-land by a stone ridge, a little higher than the surface of the ocean. The entrance to the castle was by means of a bridge, formed in the following manner:—Two parallel walls were thrown across the chasm, about eight feet asunder: upon these, planks were laid crossways for the admission of visiters, and removed again immediately afterwards. At present, one of these walls has fallen, so that the access to the ruins is extremely dangerous, as it can only be effected by walking along this remaining wall, which is but three feet in width, and considerably injured by time. Nothing accurate is known as to the date of its erection. In the fifteenth century, it was in the possession of an English family, named MacWillies, from whom it passed to the MacDonalds of the isles, and it remains the property of their descendants, the earls of Antrim, to the present day. It was the favourite residence of the latter family, till it was destroyed by fire on the 9th April, 1750.

DUNSTABLE; a market-town in the county of Bedford, thirty-three miles from London. It is situated near the Chiltern hills, and consists of four principal streets running nearly in the direction of the four cardinal points. Here is an extensive manufacture of various articles in straw, especially the well-known "Dunstable hats;" here is also one of the largest manufactories for whiting in the kingdom. Dunstable is proverbially famed for its larks, which are of a remakarble large size, and are sent to the London market in great quantities. Population in 1841, 2582.

DUPPA, Richard, Esq. LL. B. barrister-at-law, and F.S. A., in Lincoln's inn. Mr Duppa received his university education at Trinity college, Oxford, and afterwards took the degree of LL. B. of Trinity hall, Cambridge, in the year 1814. He died 11th July, 1831. He was the author of a great variety of works, of which the following is a catalogue:—"A Journal of the most remarkable occurrences that took place at Rome upon the Subversion of the Ecclesiastical Government in 1798," two editions in 1799. "A Selection of Twelve Heads from the Last Judgment of Michael Angelo, 1801," imperial folio. "Heads from the fresco Pictures of Raffaelle in the Vatican, 1803." folio. "The Life and Literary Works of Michael Angelo Buonarotti, with his Poetry and Letters, 1806." 4to. 2d edit. 1809; 3d edit. 1816. "Elements of Botany, 1809," 3 vols. 8vo. "Virgil's Bucolics, with Notes, 1810." "Select Greek Sentences, 1811," 24mo. "An edition of Martyn's Eclogues of Virgil, 1813." "On the Author of Junius, 1814." "Introduction to Greek, 1815.' "Observations on the Price of Corn as connected with the Commerce of the Country and the Public Revenue, 1815." "Classes and Orders of the Linnæan System of Botany, illustrated by select Specimens, 1816," 3 vols. 8vo. "Life of Raffaelle, 1816." "Outlines of Michael Angelo's works, with a plan, elevation, and sections of St Peter's, Rome, 1816." "Illustrations of the Lotus of the Ancients, and the Tamara of India, 1816," (only thirty private copies.) "Dr Johnson's Diary of a Journey into North Wales in 1774, with illustrative Notes, 1816," (incorporated in the late edition of Boswell's Life, by the Right hon. J. W. Croker.) "Miscellaneous Observations and Opinions on the Continent, 1825." "Travels in Italy, &c. 1828." "Travels on the Continent, Sicily, and the Lipari Islands, 1829." "Maxims, &c. 1830;" and a pamphlet on the claims of authors to their copyright.

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EAR, (*a.*) The loss of hearing very often arises from the state of the internal ear or the brain; and in most of such cases, all that science can do is to teach the fact, without furnishing a remedy. Very many of the diseases of the organ of sight, on the contrary, are situated in the eye itself, the brain and optic nerve being unaffected, and not a few of these produce partial or total loss of vision. It fortunately happens that many of these cases are within the reach of art, and by a delicate, though not a very difficult operation, the functions of the eye may be restored. But a small proportion, on the other hand, of those diseases of the ear which terminate in deafness, are situated in the external organ, and a few only of these are in the present state of knowledge within our control.

It is probable that the mere loss of hearing is not so great a privation as the loss of sight; yet we know that the deaf are ordinarily far less cheerful and happy than the blind. This can perhaps be accounted for by the fact, that the loss of hearing is more frequently in consequence of a diseased state of the brain, than the loss of sight. Another circumstance also seems to favour this opinion; and that is, that insane persons are very often deaf, while the sense of sight is rarely affected in them.

Even when deafness is the consequence of some defect in the external organs, it is not very often that it can be removed by any human means, and still less often by a surgical operation; differing essentially, in this respect, from the diseases of the eye.

It is well known that the loss of hearing sometimes arises from an obstruction of the Eustachian tube, the canal which runs from the back part of the throat to the cavity of the tympanum. Through this canal the air passes from the mouth, the membrane of the tympanum is in this way kept tense, and consequently vibrates better when sounds strike upon it. The air is occasionally prevented by colds in the head, as they are called, and other inflammatory affections about the throat, from passing through this canal, and so long as the passage is obstructed, the sense of hearing is rendered more or less imperfect. In some cases this obstruction is permanent and complete, and in such cases permanent deafness is the consequence.

From a knowledge of the fact, that the membrane of the tympanum may be ruptured, and the sense of hearing remain unimpaired, Sir Astley Cooper was led to suggest and practise an operation, in cases of deafness arising from an obstruction of the Eustachian tube, that for a time promised very favourable results. The operation was very simple; the membrane was merely punctured by some small sharp-pointed instrument like a couching-needle. The air was in this way admitted to the cavity of the tympanum, and the tension of the membrane thus restored. In some cases, there was for a time great apparent relief from the operation; the patients actually heard better, or thought they did; but the good effects were not found to be permanent, and it is now almost altogether abandoned.

EDGEWORTHSTOWN; a small neat town in the county of Longford, Ireland, fifty-two miles W.N.W. from Dublin. It contains about a thousand inhabitants, and takes its name from its proprietors, the Edgeworth family, whose mansion house is here surrounded by tastefully disposed grounds. As the home of Richard Lovell Edgeworth and his distinguished daughter, this place must always be an object of interest to the lovers of science and literature.

EDMONSTONE, R., an artist of some eminence, was born in Kelso in 1794. He was apprenticed to a watchmaker, but his attachment to painting was so strong that he soon devoted, under many difficulties, his whole time and attention to the study and practice of the art. He brought out his first productions in Edinburgh, where they attracted considerable attention, and procured him the patronage of baron Hume and other gentlemen of taste, whose friendship he afterwards enjoyed. His success soon induced him to settle in London, where he speedily attained an honourable distinction. He afterwards visited the continent, and remained abroad for some years, residing at Rome, Naples, Florence, and Venice, at all of which places he pursued his studies with so much assiduity as materially to injure his health. Among his productions painted at Rome, is the picture of the "Ceremony of Kissing the Chains of St Peter," which was exhibited and sold at the British Gallery in 1833. At Rome, he experienced a severe attack of fever, from the effects of which his constitution never recovered, and which obliged him to relinquish painting for a considerable time. On his return to London, however, at the close of 1832, he again zealously commenced his professional labours, but his health, injured by unremitting application, gave way, and, in the vain hope of deriving benefit from his native air, he left London for Kelso, where he died on the 21st Sept. 1834. As a painter, Mr Edmonstone practised both in portraits and in works of imagination; but it was chiefly in the latter he excelled, and to which his inclination turned so forcibly as to induce him almost totally to resign the other more lucrative branch of his profession. His works are remarkable for the elevated sentiment which he infused into the most simple action or attitude—for a fine tone of colouring—and for that love of tranquil beauty which no doubt originated in the bias of his own mind and feelings. He was extremely fond of children, and of introducing them in his pictures—so much so, that, with one or two exceptions, he may be said never to have painted a picture in which a child did not form a prominent object. Their infantile attitudes, traits, and expressions, were his continual study and delight; and few artists, however celebrated, can be said to have been more true or happy in rendering their artless graces upon canvas.

EDMONTON; a parish in the county of Middlesex, seven miles north from London. The village is situated on the high road from London to Ware and Hertford, and is adorned with many elegant mansions and villas. An extensive trade in timber is carried on here by means of the Lea river navigation. Population in 1841, 9027. The 'Bell of Edmonton' is celebrated in *John Gilpin*.

EDUCATION. It was stated in the public prints, some years since, on the authority of a French writer, whose name, however, is not given, that "the departments in France which are the most enlightened and send the greatest number of children to the schools, do yet produce the greatest number of criminals; and that the most moral of the departments are those which send the fewest children to the schools." In order to judge fairly of these results, provided they are truly stated, it would be necessary to know more than is told us of the precise local condition, population, wealth and moral exposures, of these contrasted departments. But, leaving the questions which these circumstances are so necessary fairly to settle, we have introduced the statement, for the sake of distinctly admitting that mere education, considered without reference to the sort of education, is not enough. We are far from saying, that the social safety and prosperity of any people is to be measured by the number of schools alone. We look with equal solicitude to the character of these schools. Knowledge, simply considered, is nothing but power. And knowledge that is crude and imperfect; that is mechanical, being rather an implement in the hands of the mind, than the culture of the mind itself; or that is speculative, being blended with no moral influences,—such knowledge is a dangerous power. The idea too much prevails, that schools have a kind of talismanic virtue to promote and preserve free institutions. We are every way placing too implicit a reliance upon schools. We should not regret it, if the experiment in this point *had* met with temporary failure in France, provided the lesson were thereby taught, that something more than bare education is necessary to train up a people to that free and happy condition, for which all enlightened nations are seeking.

Popular education, to answer its purpose, must possess a certain, definite character. And the requisites which make up this character of useful and safe popular education, must, as we conceive, be these. It must be *thorough;* it must be *practical;* and it must be *moral* or *religious*.

Thorough, we say, in the first place. We would meet the alarmist, on this subject, in the very outset. We would touch, with a decided hand, the very point of his apprehension. Thorough education, we say, is the only safe education.

Regard the diffusion of knowledge as we will, whether with fear or with favour, this is the only reasonable conclusion to which either way of viewing it can lead us. If the light could have been shut out entirely, the world might have walked in its dark way, with such dangers only as belong to darkness. But the light has broken through all the barriers, whether of jealous power, or of scholastic monopolies; the eyes of men are opened to behold it; and we might as well undertake to bar the gates of the morning, as to keep it out, or to shut again the eyes that have once seen it. Instead, therefore, of setting up temporary and local defences, frail screens, to resist this spread of knowledge, it is better thoroughly to study its laws, fully to understand its nature and its requisitions, and as fast as possible to adjust the relations of society and the principles of government to this new condition. A new element has entered into the process of civilization, and mankind must be taught, by the most thorough instruction possible, how to use it. This, we repeat, is the only sound policy on any hypothesis. If popular education be a good thing, if it be the great instrument of human improvement, if the more knowledge we have the more safety there is, then let its aid be welcomed and employed, to the utmost extent. But, even if we regarded it as a wild beast that had broken into the pale of Christendom, and which could neither be driven out nor destroyed, we should think the only policy would be, to tame and to train it to useful purposes.

Whatever opinion, therefore, a man may entertain concerning the tendencies of modern civilization, we cannot think that he properly understands the age in which he lives, if he find nothing to do but to rail against and ridicule it. Grant that there are things enough around us on which to exercise the weapons of wit and sarcasm, such weapons can no more avail to resist the progress of knowledge than would arrows to stop the sun in his course. The cause of education must take its trial; and it requires all the sober judgment there is in every country to bring the trial to a safe and happy issue.

But what we wish especially to maintain is, that this trial is safest, in being thorough. The danger, in fact, lies not in a thorough, but in a superficial education. The alarm, we are aware, of many theorists is, lest the people should know too much; but the just fear, in our apprehension, is that they will know too little. Whether as applied to the social or political relations of man, this seems to us to be true, and the true answer to the common objections against a general system of popular education.

It is objected, for instance, against carrying the education of the poor and labouring classes beyond the simplest rudiments of knowledge, that such a course will make them discontented with their sphere, will unfit them for their situation, will fill their heads with erroneous ideas of their place and duty, will puff them up with pride and arrogance. If increased facilities for improvement should awaken in some a reasonable desire to improve their condition, and should lead a few from the humbler walks of life to its highest stations, these are results to which no generous mind, surely, will object. But the *bad* effects alleged, do not arise, as we contend, from thorough, but from superficial education. It is not because men are too much educated, but because they are not enough or not rightly educated, that they become too proud for their employments. Who has not observed that this sort of sensitiveness and discontent, this fear of being degraded by what are called menial toils, this narrow-minded jealousy of their superiors, is extremely apt to manifest itself in the most ignorant persons? The very thing which such persons want is more knowledge. It is not to be made more ignorant, but to be made more intelligent. Besides, we must again remind the objector, that it is not a question about theory, but a matter of fact, that is presented to us. What the people have learned cannot be unlearned. The case of partial knowledge is the case in hand, and we must make the best we can of it. And most clearly and undoubtedly, the best that we can make of partial and imperfect knowledge is to make it more thorough and complete. Give us, we would say, if we were to speak as employers; give us intelligent persons to deal with. Deliver us from testy, suspicious, narrow-minded ignorance. Real knowledge, moreover, is itself a great resource for the mind. It gives more content to the humblest state, than any degree of observance could. It also draws to it a real respect, which is more valuable, and which is felt to be more valuable, than any homage that is ever paid to mere splendour of fortune.

The disposition to disturb the tenure of property, which is so constantly apprehended to prevail in the poorer classes of the community both at home and abroad, is, if it really exist, emphatically the offspring of ignorance. It cannot be the permanent interest of any one to do this wrong; and the desire to do it, therefore, can only spring from the rashest and blindest of impulses. To destroy the frame of society, only to roam lawless through it, for a day, can be the wish but of a fool. Property is valuable only as it is secure. It follows, that he who rationally, who intelligently desires it, must desire its security. Let any one select from the common walks of life, from the undistinguished mass of the community, ten of the best educated, most intelligent and reflecting men he knows, and compare them with ten men, if he can find them, who cannot read; and then let him decide, upon whom he would most rely to resist any popular infatuation, any torrent of numbers that was sweeping all before it; upon whose sobriety, consideration and calmness, he would most rely in any great and perilous national crisis.

The next requisite in a sound and wholesome popular education, which we have mentioned, is that it be practical.

By *practical* education we do not mean, merely or chiefly, that which is to be employed upon machinery, or upon the improvement of soils, or upon any other physical improvements, highly valuable and important as all these applications of knowledge undoubtedly are. It is that education which bears upon the machinery of the human mind, which is most truly practical,—that which breaks up "the fallow ground" of the human heart,—that which brings forth the fruits of intelligence and virtue.

Now we must be permitted to doubt whether this great, and ultimate, and truly practical end of all education is distinctly and sufficiently kept in view. Is it common, we are tempted to ask,—we know that there are instances,—but is it common for the teacher of our youth, when entering upon the discharge of his duties, to say with himself,—"now, my business is to do what is in my power to rear up for society intelligent and virtuous men and women: — it is not merely to make good arithmeticians or grammarians, good readers or writers, good scholars who shall do themselves and me credit at an examination,—this, indeed I have to do;—but it is still farther, to make good members of society, good parents and children, good friends and associates; to make the community around me wiser and happier for my living in it:—my labour, in fine, must be, to engraft upon these youthful minds that love of knowledge and virtue, without which they cannot be happy, nor useful, nor fitted for the greatest duties, and without which, indeed, all their acquisitions will soon drop like untimely blossoms from the tree of life?"

The blossoms, indeed,—to carry out the figure, —must fall; but that they may not be untimely, that they may produce fruit, there must be formed within them a germ. That germ in the human mind is the love of knowledge, is the intellectual habit that will lead to further acquisitions. Without this, education, and that which is often called the most finished education, is to little purpose. The actual knowledge acquired in our schools must necessarily, the most of it, pass away from the memory. The largest proportion of those who have studied in our colleges, after the lapse of ten or twenty years, know very little of Greek or Latin, of the mathematics or the natural sciences; and if they have gained from their studies no habits of thought, of discrimination, of research, the time and expense of their education were literally thrown away.

But to return to our common schools: there is still too much, we apprehend, that is scholastic in them. School-boy knowledge is still too much a mystery; a thing necessary to be acquired, but without any distinct and assignable reason, on the part of the pupil or the parent, or any reason assigned and kept in view on the part of the teacher. Geography, as generally taught, is still a science too technical and dry; arithmetic is attended with too little demonstration; and grammar is as dark, to multitudes of pupils, as cabalistic lore. The direct connection of all this with some useful object, either in life or in mental culture, should be continually pointed out. "The child is father ot the man;" and the child can no more study, zealously and effectively, without some useful end in view, than the man.

May not the government and instruction of a school, also, be such as will constantly appeal to the good sense, the manliness, and self-respect of the pupils, and indeed, to all those qualities which will be demanded in after life?

Finally, a safe and sound popular education must be *moral;* must be *religious;* must take hold of this nobler part of human nature, and enlist it in the cause of the common welfare. We say this nobler part; for it is but one and the same part, whether called morality or religion; the same principle, with different objects; in the one case, having regard to society, in the other to the Supreme Being; but still the same principle of rectitude. The identity in essential principle of these different regards, may be very obvious to many, but it is scarcely yet recognised in popular discussion; and it much needs to be insisted on. For although it may be too much to say, strictly and theoretically speaking, that there can be no morality without religion, yet the practical truth does not fall much short of that; and it is of the last consequence that men should feel that they are bound to the circle of their worldly duties, by their allegiance to Him who made the world.

That bond, always necessary to all well ordered society, becomes, if possible, still more important, as other bonds, those of despotic power and coercion, are loosened. There cannot, therefore, be a more fatal mistake, in educating the youth of a free country, than to leave religion out of the plan; to leave the moral culture of the mind to the influence of chance, or the inevitable results of neglect. It is to rear them up not only without reference to the essential wants of their being, and the general condition of life, but without reference to the special situation in which they are to act. A ba-

barous state of society, or a feudal state of society might go on, without much religious culture or principle; a vague superstition might suffice; but so cannot a free state of society go on. It cannot; because questions are always arising in a free community, which nothing can settle but a solemn sense of duty to the country. There is no other power that can settle them but the power of conscience. For we do not believe that there is any mysterious principle in the machinery of a free government, any conservative law amidst the conflict of its parts,—the dashing together of its struggling elements,—which is to bring out of their bare and uncontrolled action, order and prosperity. No; the elements of reason and conscience must mix in the contest, or rather they must be principles taking the guidance of it, to bring it to a safe issue.

It is strange, but not less true, that all our speculations about government have been so exclusively intent upon mere formal institutions, that there steals over the mind a feeling as if there were something visionary in appealing to the power of moral principles to stand us in stead; as if, when we lay our hand on any thing but a fixed institution or a stable law, or the visible frame of a constitution, there were nothing real beneath, to support us. But we firmly believe that it is at once the tendency and only security of free institutions, to bring the element of individual responsibility into a place in government which it has never occupied before; to make the weight of the public interest and the general weal to rest more and more upon individuals; to make men say, not always as they now do, "the constitution, the constitution," but more frequently to say, "conscience, conscience is our safeguard!"

But if this principle be so essential to popular institutions, we shall now ask, whether the culture of it ought not to be now *fully* and *formally* introduced into popular education? What indeed is the object of all judicious education, but to develope the principles of human nature? And if one of them be the moral principle, why shall it not be put to school, so to speak, as well as reason, or memory, or imagination? Why shall there not be classes in every school in the rudiments of the science of morals, as well as in the rudiments of geography, mathematics, or natural history?

Nor yet is the instructor's task accomplished, by teaching morals from a book. He ought to blend moral influences, as much as possible, with the whole course of education. He ought himself to be a man of high and pure moral sensibility; to have that strong and feeling perception of the beauty of all virtue, that would reveal itself in the glowing countenance and the kindling eye when he speaks of it; to have, moreover, that highest of all religious culture, which is requisite to the right and salutary enforcement of discipline and infliction of penalties. No man ministers at a holier altar than he. He should feel, we repeat, the declaration, that his business is to make good men, as truly as to make good scholars; that the heart is committed to his care as truly as the understanding. He may do much to mould it rightly; he must do much to influence it. The school cannot be too often contemplated, either by him or others, as a moral scene. It is, indeed, a moral scene; but it is still made too mechanical, too much in its moral administration, or too exclusively of other means, a place of palpable rewards and punishments, or of catechetical instructions and formal prayers.

Indeed, the subject of public devotions, whether in schools or colleges, seems to us to present questions of the most serious moment, and of no less serious difficulty. That they are often irksome to the pupils, we fear is too certain; and if they are so, how can they be useful? We would not recommend the disuse of them; but it does seem to us, that something should be done, by connecting them, at the time, with familiar religious instruction, and by greater simplicity and fervour in those who officiate in these services, to give them a new character. If they were less frequent, and at the same time, less hurried; if more space were given for reflection, and for the use of collateral aids, what is lost in frequency might be more than made up in impression. But, at any rate, they ought not to stand apart, as they are apt to do, from the tenor and character of every thing else in a school or university. Those who take the lead in these devotions should not be looked upon as occupying a position entirely distinct from every thing else in their character and conversation, as discharging a merely official duty, as acting their part in the mere machinery of a public institution. Their prayers should breathe the spirit of their lives; a spirit not superstitious, nor ostentatious, but cheerful, grateful and devout, and desirous of inspiring their pupils with those blessed sentiments of piety and goodness, which will be their best resource and surest safeguard in all the scenes of that world on which they are entering.

But to return: there are few departments of scholastic instruction, whether higher or lower, that may not be found to yield constant suggestions for virtuous and religious excitement. The teacher, who should skilfully avail himself of such opportunities, would produce effects upon society the most extensive and lasting, and the most delightful. Sir James Mackintosh says of Dugald Stewart, and we can scarcely conceive of a higher eulogium, that "few men ever lived, perhaps, who poured into the breasts of youth a more fervid and yet reasonable love of liberty, of truth, and of virtue. How many, (he adds,) are still alive, in different countries, and in every rank to which education reaches, who, if they accurately examined their own minds and lives, would not ascribe much of whatever goodness and happiness they possess, to the early impressions of his gentle and persuasive eloquence!" Few men indeed possess the powers or opportunities of the Edinburgh professor. But, to every instructor of youth, a sphere is opened for the exertion of the noblest talents and virtues. It is a most mischievous and absurd idea, but one that has prevailed, if it do not still prevail, that such a man is not required to possess great talents, that he may be a dull and plodding man, that he may be dull in his moral sensibility, that he need not be a religious man, and yet may very well discharge the duties of his station. But if Heaven has given to any man talent or enthusiasm, or virtue or piety, let him know that it is all wanted here, and that he can scarcely choose a nobler field for its action. Let a man enter this field, therefore, not to go through the dull round of prescribed duty;—let him throw himself into this sphere of action with his whole mind and heart, with every wakeful energy of thought and kindling fervour of feeling; to think and to act, to devise and to do, all that his powers permit, for the minds that are committed to him; to develope and exhaust his whole soul in this work; to labour for and with his pupils, to win their affection, to quicken in them the love of knowledge, to inspire, with every noble impulse, the breast of ingenuous youth; to raise up sound scholars for literature, and devoted pastors for the church, and patriotic citizens for the country, and glorious men for the world; let him do this; and none shall leave brighter signatures upon the record of honoured and well spent lives. Let him do this, and whether he sit in the chair of a university or in the humblest village school, whether as a Stewart and a Cousin, or as an Oberlin and a Pestalozzi, he may fill the land with grateful witnesses of his worth, and cause a generation unborn to rise up and call him blessed.

To the friends of education, as well as to the actual labourers in its cause, let us say, in fine, press onward. The spread of knowledge has given birth to civil liberty; the increase and improvement of knowledge must give it stability and security. The fortunes of the civilized world are now embarked in this cause. The great deeps are breaking up, and the ark that is to ride out the coming storm must have skill engaged in its construction, and wisdom to preside at its helm. The warfare of opinion is already begun; and for its safe direction, knowledge must take the leading-staff. In *this* war, not the mighty captain, but the schoolmaster is to marshal the hosts to battle. It is he that is to train the minds which are to engage in this contest. It is he that is to train up orators and legislators, statesmen and rulers: and he, too, is to form the body politic of the world. Would the free spirits of the world look to the defence and hope of their cause? It is no dubious question, where they must look. Their outposts are free schools; their citadels are universities; their munitions are books; their pioneers, the religious schoolmaster and the pious pastor; and the mighty engine that is to hurl destruction upon the legions of darkness, is the FREE PRESS. Other ages have struggled with other weapons; but the panoply of this age must be knowledge: the gleaming of its armour must be the light that flashes from the eye of free high-minded public opinion. Call this complimenting, call it complaisance to the base multitude, call it visionary speculation, call it what you will; but the doctrine is true: and, over the liberties of the world, whether prostrate or triumphant, that truth must rise brighter and brighter for ever.

EDWARDS, WILLIAM, an ingenious practical architect, was a native of Glamorganshire, in Wales, where he was born in the year 1719. He had the misfortune to lose his father, who was a farmer, when he was only two years old; but his mother continued to hold the farm, and was, in this manner, enabled to bring up her family. When about the age of fifteen, he first began to employ himself in repairing the stone fences on the farm; and in this humble species of masonry he soon acquired so much expertness as to be employed by neighbouring farmers in similar occupations. He afterwards undertook to build a workshop for a neighbour, and he performed his task in such a manner as gained him great applause. Very soon after this, he was employed to erect a mill, by which he still further increased his reputation. He was now accounted the best workman in that part of the country, and being highly esteemed for integrity and fidelity to his engagements, as well as for his skill, he had as much employment in his line of a common builder as he could undertake. In his twenty-seventh year, however, he was induced to engage in an enterprise of a much more difficult and important character than anything which he had hitherto attempted. Through his native parish runs a river called the Taff, which flows into the estuary of the Severn. It was proposed to throw a bridge over this river at a particular spot, where it crossed the line of an intended road; but to this design difficulties of a somewhat formidable nature presented themselves, owing both to the great breadth of the water, and the frequent swellings to which it was subject. Mountains, covered with wood, rose to a considerable height from both its banks, which first attracted and detained every approaching cloud, and then sent down its contents in torrents into the river. Edwards, however, undertook the task of constructing the proposed bridge, though it was the first work of the kind in which he had ever engaged. Accordingly in the year 1746, he set to work, and, in due time, completed a very light and elegant bridge, of three arches, which, notwithstanding that it was the work of both an entirely self-taught, and an equally untravelled artist, was acknowledged to be superior to any thing of the kind in Wales. So far his success had been as perfect as any thing could be desired. But his undertaking was far from being yet finished. He had, both through himself and his friends, given security that the work should stand for seven years, and for the first two years and a half of this term, all went on well. There then occurred a flood of extraordinary magnitude which swept away the whole structure. This was no light misfortune in every way to poor Edwards; but he did not suffer himself to be disheartened by it, and he immediately proceeded, as his contract bound him to do, to the erection of another bridge. He now determined, however, to span the whole width of the river, by a single arch of the unexampled magnitude of 140 feet from pier to pier. He finished the erection of this stupendous arch in 1751, and had only to add the parapets, when he was doomed once more to behold his bridge sink into the water over which he had raised it, the extraordinary weight of the masonry having forced up the key-stones, and, of course, at once deprived the arch of what sustained its equipoise. Heavy as was this second disappointment to the hopes of the young architect, it did not shake his courage any more than the former had done. The reconstruction of his bridge, for the third time, was immediately begun with unabated spirit and confidence. Still determined to adhere to his last plan of a single arch, he had now thought of an ingenious contrivance for diminishing the enormous weight which had formerly forced the keystone out of its place. In each of the large masses of masonry, called the *haunches* of the bridge, being the parts immediately above the two extremities of the arch, he opened three cylindrical holes, which not only relieved the central part of the structure from all over-pressure, but greatly improved its general appearance in point of lightness and elegance. This bridge, which, at the time of its erection, was the largest stone arch known to exist in the world, was finished in 1755—the whole undertaking having occupied the architect nine years in all—and it has stood ever since. Edwards afterwards built many bridges in South Wales, having their arches formed of segments of much larger circles, and consequently much more convenient. He found his way to this improvement entirely by his own experience and sagacity; as, indeed, he may be said to have done in regard to all the knowledge which he possessed in his art. Even his principles of common masonry, he used himself to declare, he had learned chiefly from his studies among the ruins of an old Gothic castle in his native parish.

Edwards was likewise a farmer to the end of his days. Such, moreover, was his unwearied activity, that, not satisfied with his week-day labours in these two capacities, he also officiated on the Sabbath as pastor to an Independent congregation, having been regularly ordained to that office when he was about thirty years of age, and holding it till his death. He accepted the usual salary from his congregation, but returned it all, and often much more, in charity to the poor. He always preached in Welsh, though early in life he had made himself acquainted with the English language. He died in 1789, in the seventieth year of his age, leaving a son who inherited his abilities.

EGERTON, Daniel, formerly of Covent Garden Theatre; was born in London on the 14th of April, 1772. His paternal name was Bradstock; and he was originally a clerk in the court of requests at Whitechapel, which he abandoned to join the Royal Theatre after Palmer retired from its direction. He made his debût at Birmingham, on the 4th of June, 1799, as *Captain Absolute* in "The Rivals," and he continued there for the two following summers, passing the intermediate winters with Mr Stephen Kemble in Edinburgh, who transferred him to the boards of Newcastle-upon-Tyne, where he first appeared in Nov. 1801. Two years after, he accepted an engagement at Bath, where he made his first appearance for the benefit of Mrs Edwin, in May, 1803, as *Frederick Bramble*, in Colman's comedy of the "Poor Gentleman." On Elliston's final secession from the Bath Theatre, the field was left open to Mr Egerton, who led the business of that establishment for the next six years, until, in 1809, he was engaged at Covent Garden Theatre, and made his appearance there in Oct. as *Lord Avonmore*, in Morton's comedy of the "School of Reform." Here he distinguished himself by great assiduity, and became favourably established for many years, and in the summer season rented and superintended the performances at Sadler's Wells. About three years before his death, he withdrew himself from Covent Garden, and embarked with Mr Abbott, formerly of the same theatre, in the management of the Cobourg. The speculation, however, failed; and by it Mr Egerton not only sacrificed the hard earnings of a long career, but, to extricate himself from the difficulties in which it involved him, he was compelled to take the benefit of the insolvent act, which, it is supposed, helped to accelerate his death, which took place at Chelsea, in July, 1835. His only dependence at his decease was a pension of £75 from the Covent Garden Theatrical fund, of which he was for many years secretary.

EGGS, (*a*.) A large number of the eggs consumed in London are brought from France, chiefly from the department of the Pas de Calais, which is opposite to the coasts of Kent and Sussex. A writer in a newspaper printed at Arras, the capital of the department, recently made strong complaints of the dearness of eggs in that part of France, and after remarking that the immense quantity sent over to England was the cause of the high price, he entered into the following calculations as to the value of this branch of trade:—"Out of 72,000,000 of eggs annually imported into England from France, Germany, the Netherlands, and other countries, France contributes 55,000,000. Calculating the first cost at about 4½d. per dozen, England pays annually to France for eggs about £77,000. Suppose the freight, the profit of the importer and retail dealer, the import duties, the loss by breakage and other damage, to increase the price to about 1s. 3d. per dozen, the total amount paid by consumers of French eggs in England will be no less than £192,000." The price of French eggs in the shops in London is greatly exaggerated in this statement, and the French writer has mis-stated the total quantity imported, though he is perhaps correct as to the number imported from France. From an official account, we perceive that the importation of eggs from all parts in the year ending January 5th, 1837, was 69,000,000; and the duty of 1d. per dozen produced so large a sum as £24,048. In 1820 the quantity of eggs imported was 31,000,000, the duty being the same as at present, and yielding a revenue of £11,077. In 1827 the importations were nearly as great as during 1834 and 1836, which were the highest years of importation for eggs which have yet occurred. These 69,000,000 of eggs cannot be obtained from much fewer than 575,000 fowls, each producing 120 eggs on an average, all beyond this number being required for domestic consumption. Assuming the grounds of this calculation to be correct, the 55,000,000 eggs supplied by France are the production of 458,333 fowls, each of which furnishes ten dozen eggs, imported at a duty of 10d., being a tax to that amount on each fowl.

"In 1813," says M. Legrand, "the number of eggs exported from France was 1,754,140. Between 1816 and 1822 the numbers exported rose rapidly from 8,733,000 to 55,717,500, and in 1834 the number had increased to 90,441,600. In 1835, 76,190,120 were exported for England, 60,800 for Belgium, 49,696 for the United States, 42,960 for Switzerland, 34,800 for Spain, and 306,304 to other parts of the world. The total amount of the exportations for that year was 3,829,284 francs. The consumption in Paris is calculated at 115⅝ eggs per head, or 101,152,400. The consumption in other parts of France may be reckoned at double this rate, as in many parts of the country dishes composed of eggs and milk are the principal items in all the meals. The consumption of eggs for the whole kingdom, including the capital, is estimated at 7,231,160,000; add to this number those exported and those necessary for reproduction, and it will result that 7,380,925,000 eggs were laid in France during the year 1835."

EGREMONT, Earl of. The Right Hon. George O'Brien Wyndham, third Earl of Egremont and Baron Cockermouth (1749,) and the sixth Baronet (of Orchard Wyndham, Somersetshire, 1661), F.R.S. and F.S.A., was born Dec. 18, 1751. He succeeded to the peerage when a child, by the death of his father, Aug. 21, 1763. His education was at Eton. The heir to a splendid fortune,[*] which was much augmented during his minority, the earl of Egremont, from his earliest years, displayed that liberal spirit, and patrician magnificence, for which he was distinguished throughout his long life. Naturally endowed with fine taste, his mind received all that cultivation which wealth and rank command, and which serve to make the well educated Englishman at once sound and solid in the graver walks of knowledge, and accomplished in those which adorn every birth and station. Without taking a very prominent part in the discussions of that branch of the legislature of which he was a member, his lordship always enjoyed much political consideration. In times of pressure and peril, his purse, his example, and his exertions were nobly devoted to the cause of his country. In his patronage of living artists and of our native school, his munificence was conspicuous. Many of the finest pictures produced in our day in England, and certainly the very finest works of sculpture, were the results of his unlimited commissions; and while he added splendour to his palace by these works (he built large galleries at Petworth House, Sussex, purposely for their reception), he did not neglect the more humble aspirant—youth beginning to toil for fame, merit obscured, and industry too scantily requited. His native affection for the fine arts was strengthened and confirmed by his having, when about eighteen years of age, resided for some length of time at Dresden and Vienna, with his father-in-law, Count Bruhl; when he constantly spent a portion of almost every day in the renowned galleries of those cities. He thus became qualified to appreciate and enjoy the beauties and excellencies of the important collection of pictures and statues which he inherited, and inclined to extend it during the whole course of his long and useful life. At first he added pictures by the older masters; but he afterwards resolved to buy none but modern productions; observing, that he could most beneficially patronize the arts, and render them useful and honourable to the country, by encouraging genius and talent sufficiently developed at home, and well worthy of support; and this amiable and patriotic resolution he steadily maintained. Hence are to be seen, in his extensive and valuable collection, upwards of two hundred modern British productions in painting and in sculpture; the greater part purchased by his lordship from artists now living, the rest at public or private sales, as circumstances permitted, or of the artists themselves, during their lives. In all other relations of society, lord Egremont was equally liberal and magnificent. His charities were as prompt and ample as their occasions were numerous. He died on the 11th Nov. 1837, and was succeeded in the title by a nephew. By a lady now deceased, who bore the name of Mrs Wyndham, the daughter of the Rev. Mr Iliff, one of the under masters of Westminster school, the earl of Egremont had issue three sons and three daughters. The former are, George Wyndham, Esq. now of Petworth, colonel in the army; Henry Wyndham, Esq. of Sladeland, Sussex, a major-general in the army; and Charles Wyndham, Esq. of Rogate, Sussex, a colonel in the army. The daughters are, Frances, married to Sir Charles Merrik Burrell, Bart. Mary, married in 1819 to George, earl of Munster, eldest son of his late Majesty William IV., and —— married to John King, Esq.

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[*] It is stated that, when the earl succeeded to the title and estates, the rental amounted to not quite £45,000 per annum, which at the time of his decease had been increased to £81.000 annually. In the last sixty years he had distributed in acts of charity and liberality the immense sum of £1,200,000, or about £20,000 yearly.

EGRIPOS; a town of Greece, situated on the west side of the island of Eubœa, now commonly called the Negropont, which forms a part of the new kingdom of Greece. Egripos is in N. lat. 38° 26′, E. long. 23° 37′, and stands at the narrowest part of the channel, which separates the island from the main land. Egripos were formerly a Greek town, under the name of *Chalcis;* but in modern times once belonged to the Venetians, when that mercantile and warlike state possessed a large part of Greece, with many of the islands, and carried its conquests and its commerce all over the eastern part of the Mediterranean. Egripos is defended on the land side both by a ditch and wall, which latter indeed runs all round it, and shows by the numerous winged lions of St Mark that the Venetians were the builders. The town is (or, we should perhaps rather say, was) exclusively inhabited by the Turks: the Greeks and Jews dwell in a small suburb to the north of the town and carry on a little trade. This place, if Greece ever becomes populous and well-cultivated, would serve as the place of export for the fertile island of Eubœa, which has no port on its iron-bound eastern coast, and would also furnish an outlet for the produce of the rich plains of Bœotia which lie opposite the town on the west.

The channel, which separates the island from the mainland, presents a curious phenomenon. It is here only forty yards wide; and it is further divided into two parts by a rock, on which a fort is built. The passage between the rock and the main land is the wider of the two, but has not more than three feet water. The other passage between the rock and the walls of the town is thirty-three feet wide, and when the water is highest is seven feet deep in the shallowest parts. The Mediterranean, it is well known, like other inland seas, is very little affected with tides, though, undoubtedly, it has tides to some extent; and these, from the configuration of the coasts, may be felt more in some parts than others. This deeper channel, however, presents most extraordinary and irregular tides or currents, which, though found by observation to depend in some degree like other tides on the moon's attraction, are not reducible to a regular system. Sometimes the water will run as much as eight miles an hour, with a fall of about one foot and a half under the bridge. It is seldom at rest, changes its direction in a few minutes, and will at once resume its usual velocity of four or five miles an hour in either direction, as it may happen to run. The greatest rapidity is always to the south. The immediate cause of this phenomenon must be the continued variation of the relative level of the waters on the north and south side of the channel, which is not wide enough to allow such a free communication as would ensure either a constant level, or a constant current in one direction. But what cause this perpetually varying level is owing to, or to what combination of causes, is difficult to say. The changing winds, particularly those from the N. E., may be one cause. The current from the Dardanelles sets fairly on the east side of the island, and it is therefore supposed can have no effect on the stream of the Euripus, though this appears by no means certain. Aristotle, it is said, laboured in vain to find out the cause of this phenomenon, and according to some accounts, drowned himself out of chagrin at being thus foiled. However this may be, Aristotle died at Chalcis or Egripos.

EICHHORN, J. G., was born, 1752, in the principality of Hohenzollern-Oehringen. He acquired his first celebrity as professor, at Jena, by his history of the commerce of East India before Mohamed, in 1775, whence he removed, 1788, to Gottingen. Being an excellent oriental scholar, he began, about the same time as Michaelis, to subject the bible to a more minute scrutiny. The critical study of the original text led him in his introduction to the New Testament, to start a new and ingenious hypothesis on the origin of the Gospels. There existed, Eichhorn asserts, an original document in the Aramaic language, from which the three first Gospels have been drawn: it contained but a short narrative of the principal transactions of Jesus Christ, from his baptism to his death, not in a chronological order, but composed from communications made by the apostles. This groundwork formed the materials from which those apostles, who had an intention to write, constructed a more complete history. The hypothesis has been introduced into this country by the bishop of Peterborough. The two last volumes of this *Introduction* appeared only a short time before Eichhorn's death. The hypothesis itself, although, indeed, more specious and dazzling than natural and satisfactory, has had this beneficial result, that it set the theologians, not only of Germany, but also of other countries, at work, and most important and useful researches have been made in consequence of it. On the other hand, this elaborate criticism has, unfortunately, occasioned in this country the condemnation of German divinity altogether. Eichhorn distinguished himself not only as an orientalist and divine, but also as an historian and bibliographer. He published a "History of Literature, from its Beginning to the Latest Times," in 11 vols.; a "General History of Culture and Literature of Modern Europe," in 2 vols.; a "History of Eloquence, in the Modern Languages," in 3 vols.; a "History of the Three Last Centuries," in 6 vols.; besides a "General Library of Biblical Literature," in 10 vols.; and a "Repertorium of Biblical and Oriental Literature," in 18 vols.; an "Introduction to the Old Testament," in 5 vols.; and the "Introduction to the New Testament," of which we have spoken, also in 5 vols. He translated also the Hebrew Prophets, in 3 vols. From this list, which is far from being complete, our readers may form an idea of the indefatigable labours of the German divine. He was also the editor of the Goettingen Anzeigen. He enjoyed the highest reputation all over Germany, and was on terms of the most intimate friendship with all his colleagues at Gottingen. From the gradual decline of his strength, he felt the approach of death with the most imperturbable tranquillity, and he remarked, in the last hour, to his friend, the anatomist Langenbeck, and the celebrated professor Blumenbach, as a point of physiological curiosity, how he felt by degrees the vital spirit withdrawing from the different parts of the body, and, only a quarter of an hour before he breathed his last, he yet distinctly stated that life was becoming extinct in the spina dorsi. He died on the 25th of June, 1827. His son, also professor at Gottingen, has distinguished himself by an excellent work "on the History of the German Law."

ELDON, John Scott, Earl of, for twenty-five years Lord High Chancellor of England, was the third and youngest son of William Scott, hoastman, or coal-fitter, of Newcastle-upon-Tyne. Nearly six years the junior of his brother lord Stowell, he was born on the 4th of June 1751; which, being the birthday of his old master and kind friend, George III., the king was wont to say—"Do not speak to me, Lord Eldon, till I have paid my respects to *you* on your birth-day." He received his youthful education at the grammar-school of Newcastle; and at the early age of fifteen was sent to the university of Oxford. He was elected fellow of university, July 11, 1767; proceeded to the degree of Bachelor of Arts, Feb. 20, 1770; and gained the chancellor's prize, "On the Advantages and Disadvantages of Foreign Travel," in 1771. He proceeded to the degree of M. A. Feb. 13, 1773, having been admitted a member of the Middle Temple on the 28th of the preceding month. With the exception of keeping term, he resided, however, in or near Oxford. The vacations were spent at the house of his friend Mr Lane, at Mill-end near Henley. During this time, in order to increase his income, he took a part in the tuition of University college. He also read lectures as the deputy of Sir Robert Chambers, the Vinerian professor of common law. This was from 1774 to 1776; on the 9th Feb. in the latter year he was called to the bar, and quitted Oxford for the metropolis. He gave his attention principally to conveyancing, and the practice of the courts of equity; but, after some years of laborious study, his prospects were so discouraging, that he resolved to quit London, and practise as a provincial counsel in his native town. But in the spring of 1781, he was retained to argue a case before a committee of the house of commons, and the ability which he manifested was soon circulated through the profession, with the report that he had resolved to leave London. Mr Mansfield and Mr Wilson, two of the most eminent counsel, conjured him not to quit Westminster Hall. They assured him that his success was certain; and Mr Wilson (afterwards a judge of the common pleas) added, that the want of money ought not to deter him, for the assistance of many was ready to be proffered, and that he had the small sum of £500, which he was desirous to invest on this certain security. This kind offer, which was made on Mr Scott's return from the committee-room to his house, he was not under the necessity to accept, as from that period all his wants were supplied, and more than supplied, by his own exertions. Shortly after, he became the leader on the northern circuit. The great lord Thurlow soon understood, and therefore appreciated, his abilities; he would have bestowed upon him a mastership in chancery, which, however, Mr Scott declined. His powers now became manifest, and in 1783 a patent of precedence was granted him by lord Loughborough, then first commissioner of the great seal. In the same year, Mr Scott was introduced into parliament, upon lord Weymouth's interest, for the borough of Weobly, for which he continued to sit until 1796. As a parliamentary speaker, his merit was considered inferior to his professional abilities as a pleader. There was a want of that warmth and animation—that bold declamatory vehemence, that distinguish the senatorial from the forensic orator. His speeches were always shrewd and clear—addressed to the understanding rather than the fancy—impressive, but not sufficiently animated. In the month of June, 1788, he was appointed solicitor general, and was knighted—an honour which it appears he was desirous of declining, but it was insisted upon by his majesty. Only one instance had then occurred of a solicitor-general being knighted since 1723, though subsequently it has become customary. Shortly after this time, his majesty's first illness occurred, and the country was in consequence much agitated upon the Regency question. The bill introduced by Mr Pitt on that occasion, was drawn by Sir John Scott; to whom also are attributed the line of conduct adopted by the minister, and the truly constitutional doctrines for which he contended.

Sir John Scott's progress towards the highest honours was certain, but gradual. His merit continually developed itself, and familiarity with the forms of business, a habit of public speaking, and acquaintance with his own powers, wore away the diffidence by which he had formerly been oppressed. On the 13th of February, 1793, he was appointed attorney-general, which office he held for six years. During that time, his labours were unremitting. Often was he seen at five o'clock in the morning in Lincoln's Inn-fields, walking to his chambers. In 1796, he was returned for Boroughbridge as the colleague of Sir Francis Burdett. On the death of Sir James Eyre he succeeded him as lord chief justice of the common pleas; and, on the 18th of July, 1799, was raised to the peerage as baron Eldon, of Eldon, in the county of Durham. But this was only a foretaste of the honours which his knowledge and ability were certain to secure; and accordingly, in 1801, he became lord high chancellor of England. In the same year he was nominated high steward of the university of Oxford, by the duke of Portland, then chancellor of the university; a nomination ratified by the unanimous vote of convocation, by which the degree of D.C.L. by diploma was immediately after conferred upon him. Lord Eldon resigned the great seal on the 7th of February 1806; he was re-appointed April 1, 1807, from which period he continued in office until 1827, being altogether a period of nearly twenty-five years. He died on the 13th Jan. 1838.

Testimonies to the judicial merit of lord Eldon are so common that the difficulty lies in selection. Perhaps that of Sir Samuel Romilly—himself one the purest and ablest of men—is the highest in point of authority. He stated in the house of commons on the 7th of March, 1811, "that there never was a man in the court of chancery who more endeared himself to the bar, or exhibited more humane attention to the suitors. There never presided in that court a man of more deep and various learning in his profession; and in anxiety to do justice, that court had never seen, he would not say the superior, but the equal of the lord chancellor. If he had a fault, it was an over-anxiety to do justice." It was his peculiar gratification, in his latter days, to speak freely of the imputations of delay and indecision which had been raised against him, with feelings of conscientious satisfaction, and a declaration to those to whom his heart was really open, that all the virulence with which he had been attacked on this score weighed but as a feather in the balance against the blessed conviction in his own mind, that he had never decided a case until he had perfectly satisfied himself upon its real merits. His reported judgments are contained in twenty volumes; and of the whole few indeed have been reversed.

In personal appearance, lord Eldon was everything that might be expected in a supreme judge: the deep thought betrayed in his furrowed brow—the huge eye-brows, overhanging eyes that seemed to regard more what was taking place within than around them,—his sternness, dignity, and venerable age, all tended to inspire respect. His voice was very remarkable. It was so weak that to persons unaccustomed to hear him in his court, he seemed rather to whisper than to speak; but his utterance was extremely distinct. and his clear, soft, low tones were singularly forcible and impressive. In private life he was exemplary. He never appeared to such an advantage as amidst the charities of home, by his own fireside, where, with the friends who loved him, his relations, his children, and grand-children, he passed the declining years of his life, submitting with tranquillity and cheerfulness, which never forsook him, to the infirmities from which at his advanced age he could scarcely hope to be exempt. By his wife, Elizabeth, daughter of Aubone Surtees, Esq. banker, of Newcastle-upon-Tyne, the earl of Eldon had two sons and two daughters.

By his will, he left to his elder daughter, the lady Elizabeth Repton, a life interest in £4000 per annum; to lady Frances Bankes, £4000 a year; to his grandsons, the children of Mr Bankes and Mr Repton, £10,000 each, and £5000 each to the grand-daughters. To his butler he left a £100 a year for life; £50 each to all the servants that lived with his lordship above a certain number of years, and £20 to every other domestic in his service. All the residue of his vast property he left to his grandson, the present earl of Eldon, with remainder over to the male children of his daughters in succession, in the event of his lordship (who has three daughters) not having male issue; but giving the earl power of making ample settlements on the female children. The personal property was sworn to be under £700,000.

ELEVATION OF LAND. That our existing continents and islands have been raised from the bed of the ocean by successive eruptions of igneous rocks, is now an established fact in geology. That these elevations took place at different times with considerable intervening periods, is also apparent, from the unconformable manner in which the successive formations are inclined towards each other, and the different characters of the organic remains found in each. Some geologists suppose that these elevations were paroxysmal, others again that they have been gradual and continuous. One thing appears evident, that repeated elevations must have taken place before the strata were finally raised above the level of the ocean. Mr Lyell concludes that almost the whole of Europe emerged from the ocean at a period posterior to the deposition of the chalk. Although it appears that the principal changes have taken place in the strata of the old continents, previous to, and at the period of their final emergence from the ocean, yet there are also indications that since the commencement of the existing state of things, and the introduction on the surface of the present system of vegetable and animal life, considerable elevations of our shores have taken place, and are still in progress. These comparatively modern changes have been recently investigated and described by several observers. Mr Lyell first pointed out the elevation of the rocks on the coasts of Sweden and Denmark, and the existence of recent balanæ still adhering to these rocks at a considerable elevation above the highest tide marks. He also has pointed out the existence of modern shells in the silt or loess of the valley of the Rhine, from below Cologne to the falls of Schaffhausen, at an elevation of 3 to 400 feet above the river. Shells of existing testacea have also been found at various elevations among the diluvial deposits of the counties of Lancashire, Cheshire, and north Shropshire, and on Moel Tryfane mountain near the Menai Straits, at an altitude of 1392 feet above the level of the sea. Mr Smith, Jordanhill, has also discovered recent marine shells at various elevations on the Frith of Clyde, among which are found several living genera, but not now inhabitants of the Clyde. Appearances of elevated sea beaches are also observable in the east coast of Scotland, about Dunbar and other parts of East and Mid Lothian. In the north of Scotland also the same appearances are visible on the Morayshire coast, bordering the Moray Frith, where there are several caves and isolated rocks, which have evidently owed their excavations to the action of the sea, but which are now elevated beyond the reach of the highest tides; recent marine shells are also there found on raised beaches, and a longitudinal rent or fraction of this sandstone, which had evidently occurred long after its original consolidation, can be traced extending for miles along this coast.

ELFORD, Sir William, bart., of Bickham near Plymouth, F.R.S. and F.L.S., late recorder and M.P. for Plymouth, and lieutenant-colonel of the South Devon militia, was descended from an ancient Devonshire family, and was the elder son of the Rev. Lancelot Elford, vicar of Plympton, by Grace, daughter of Alexander Wills, of Kingsbridge, Esq. After acting for some time as major of the South Devon militia, he became first lieutenant-colonel in 1796. In the same year he was returned to parliament for the borough of Plymouth, of which he was previously recorder. He supported the policy of Mr Pitt; and on the 14th of Nov. 1800 he received a patent of baronetcy. At the general election of 1802 he was rechosen for Plymouth without opposition; but in 1806 was defeated by Sir C. M. Pole, bart. He died Nov. 30, 1838. Sir William was a skilful amateur painter, and there was scarcely an exhibition of the royal academy for a long series of years, without a contribution from his easel. His subjects were usually landscapes. He was also attached to scientific inquiries.

ELGIN, (a.) The cathedral of Elgin is situated at the eastern extremity of the town, and not in the centre of the burgh, as stated in some impressions of the Encyclopedia. It was dismantled of its lead by the earl of Murray, regent of Scotland, in order to replenish his exhausted coffers. Agreeable to the mandate of the regent, the Elgin and Aberdeen cathedrals were unroofed, and the lead was shipped at the latter place for Holland; but scarcely had the vessel left the harbour than she sunk, and was, with her crew and cargo, wholly lost. The Elgin cathedral thus uncovered was never repaired, owing, no doubt, to the progress which the doctrines of the reformation had by this time made; and being thus exposed to the elements, the wooden part of the great tower gradually gave way, and on Easter Sunday morning, 1711, it entirely fell to the ground. In order, as far as possible, to prevent the cathedral from undergoing further dilapidation, the barons of exchequer some years since granted a sum of £900 to keep it in repair. An ascent to the top of the two largest steeples, by means of interior stairs, which could not formerly be ascended, was then rendered easy; by which means the visitor can command one of the most extensive and richest prospects in Scotland.

The diocese of Moray, of which this splendid building was the cathedral church, was one of very great extent. It comprised the counties of Elgin, or Moray, and Nairn, and the greatest part of the counties of Banff and Inverness, and had no fewer than fifty-six pastoral charges belonging to it. The last bishop of the diocese was Patrick Hepburn, known in Scottish history as the ecclesiastic who was fined for receiving into his house the intercommuned earl of Bothwell.

The cathedral is surrounded by a burying-ground, one of the largest churchyards perhaps in Great Britain: in it are interred the remains of many distinguished persons, including several of the kings of Scotland.

ELLISTON, Robert William, an eminent performer in the higher walks of comedy, was born in London, April 7, 1774. His father, a watchmaker, was the youngest son of an eminent farmer at Gidgrave, near Orford, in Suffolk, and brother to the Rev. William Elliston, D. D. master of Sidney-Sussex college, Cambridge. At nine years of age young Elliston was placed at St Paul's school, where, it is said, his ambition for scenic celebrity was first excited by the applause he received at the school speeches in 1790, on delivering an English thesis. He is remembered, about the same period, to have represented Pierre, in "Venice Preserved," at some private performances at the Lyceum; and he shortly after abruptly quitted school (at the time he was the fourth boy) without the knowledge of his friends. He wandered to Bath, where he found an opportunity of making his theatrical essay, in the humble part of Tressel, in "Richard the Third," April 21, 1791. Although this performance was very successful, the manager was not able to offer him a permanent engagement: he obtained, however, a letter of recommendation to Tate Wilkinson, at York, who immediately engaged him. The principal characters in Wilkinson's company being entirely pre-occupied, the truant in a short time became weary of his situation, and wrote to his uncle a letter supplicating for forgiveness. He was allowed to return to his family, but could not be persuaded to relinquish his taste for the stage. In 1793 he appeared a second time at Bath, in the character of Romeo: and during the season he continued to play a variety of characters in tragedy, comedy, opera, or pantomine. In 1796 he carried off from Bath Miss Rundall, a teacher of dancing; and soon after their marriage in London made his first bow to a London audience at the Haymarket June 24, of that year, in the very opposite characters of Octavian in "The Mountaineers," and Vapour in "My Grandmother." From the Haymarket Mr Elliston was engaged to perform for a limited number of nights at Covent Garden; but, owing to some disagreement with Mr Harris, he again joined the Haymarket corps; and on Mr Colman's new arrangement in 1803, he became not only his principal performer, but also his acting manager. In the succeeding year, when John Kemble quitted Drury Lane, Mr Elliston was engaged to supply his placed: after the theatre was burnt, when the company performed at the Lyceum, he left it in consequence of some quarrel with Thomas Sheridan. He then took the circus, and having given it the name of the Surrey Theatre, commenced performing some of the best plays of Shakspeare, and some operas, having so far altered them as to bring them within the meaning of the license; a practice which he defended in a well-written pamphlet. He acted the principal parts, and was equally applauded in Macbeth and Macheath. In 1805 he published "The Venetian Outlaw, a Drama in three acts," which he had himself adapted from the French—"*Abellino, le grand Bandit.*" On the re-opening of Drury Lane Theatre, Elliston again formed part of that company: on the first night he delivered Lord Byron's opening address, and personated the character of Hamlet. When the theatre was let out on a lease in 1819, he became the lessee, at a yearly rent of £10,200; and so continued until declared a bankrupt, in 1826. After some speculations in the Olympic theatre, he again undertook the superintendence of the circus, and occasionally performed upon its boards, in Cumberland's Jew, Dr Pangloss, and some smaller parts. His death was occasioned by apoplexy, on Friday, the 7th of July, 1831. Elliston is immortalized by the subtlist of dramatic critics, Charles Lamb, who has two papers upon him in his own exquisite style. Other distinguished critics speak highly of him. "Mr Elliston," says Leigh Hunt, "was the best comedian, in the highest sense of the word, that we have seen. Others equalled him in some particular points; Lewis surpassed him in airiness; but there was no gentleman comedian who comprised so many qualities of his art as he did, or who could diverge so well into those parts of tragedy which find a connecting link with the graver powers of the comedian in their gracefulness and humanity. He was the best *Wildair*, the best *Archer*, the best *Aranza;* and carrying the seriousness of *Aranza* a little further, or making him a *tragic gentleman* instead of a comic, he became the best *Mortimer*, and even the best *Macbeth*, of any performer who excelled in comedy."

ELRINGTON, THOMAS, D.D., lord bishop of Leighlin and Ferns, M.R.I.A., &c. &c. Mr Elrington obtained a scholarship in the university of Dublin in 1778; and in 1781 was elected Fellow. In 1794 he became the first Donnelan lecturer, elected on the foundation of Mrs Anne Donnelan, of the parish of St George, Hanover Square, in the county of Middlesex, spinster. The subject of his lectures was, "The proof of Christianity derived from the miracles recorded in the New Testament." These lectures were printed in Dublin, in 8vo. 1796, together with the Act Sermon, which he preached Nov. 15, 1795, for the degree of Doctor of Divinity. In 1795 he was chosen professor of mathematics; and on the 25th of Dec. 1806, he was presented to the rectory of Ardtrea, in the county of Tyrone, and diocese of Armagh. In 1811, he was appointed provost of Trinity college; a situation which he filled for several years with the highest credit to himself, and advantage to those whose interest and welfare it was his happy lot to promote. In the year 1820, he was consecrated bishop of Limerick; and he was translated, in 1822, to the see of Leighlin and Ferns. Dr Elrington published an edition of Euclid, enlarged by notes, which is now the text book in the Dublin university, and throughout Ireland. He also presented the literary world with a valuable edition of Juvenal, illustrated by notes critical and explanatory. His polemical publications were, "Reflections on the Appointment of Dr Milner as the political agent of the Roman Catholic Clergy of Ireland," 1809, 8vo.; "The Clergy of the Church of England truly ordained," 1809, 8vo.; and some other pamphlets. Dr Elrington died at Liverpool, on his way from Dublin to London, in July, 1835.

ELSTOW; a parish and village in the county of Bedford. The village, which is a mile and a quarter from the town of Bedford, is only remarkable as the birth-place of John Bunyan, born here in 1628. Numerous engravings have been made of the house of his nativity. Population of parish in 1841, 562.

ELVAS; a city of Portugal, in the province of Alemtejo. Though ranked the second city of the Alemtejo, it is decidedly the best fortified and the strongest, the defensive works being a *chef d'œuvre* of the Conde La Lippe Schomberg, and a perfect model of their kind. Fort La Lippe, situated on a steep hill at the back of the city, is impregnable except to famine; and fort St Lucia in the front, connected with the redoubts on either side, is of sufficient importance to cause much trouble to a besieging force. There are three gates to the city; the Porta d'Esquina on the north; the Porta d'Olivença in the centre, and the Porta de San Vicente on the south; all strongly fortified, with ravelins, cavaliers, and counter-guards, forming a curve bent outward. The only gate by which strangers are allowed to enter is the Olivença, because they are thus forced to pass one-half of the works, and are exposed to the observation of a long chain of sentinels. From this gate several long and narrow streets diverge into different parts of the city.

The walk round the ramparts is extremely fine, affording an uninterrupted view of the country for several leagues around. Here may be seen the plain and unpretending slabs laid over the remains of two of our gallant countrymen, brigadier-general Houghton and colonel Oliver; the one fell at Badajoz, the other at Albuera; both which fields are overlooked from the rampart where they repose. The inscriptions are in English and Portuguese, and are simple and unpretending.

ELY, ISLE OF; a large district in Cambridgeshire, consisting of a great part of the county, surrounded by large fens, which were formerly overflowed with water. It extends from the bridge at Tyd, on the north, to Upmere on the south, about twenty-eight miles in length; and from Abbots on the east, to the river Nene, near Peterborough, on the west, about twenty-five miles in breadth. It is bounded on the north by Lincolnshire, on the west by Northamptonshire and Huntingdonshire, and on the east by Norfolk and part of Suffolk.

The *city of Ely* is situated on the banks of the river Ouse, about the centre of the county of Cambridge, sixty-seven miles N. by E. from London, sixteen N.N.E. from Cambridge, and thirteen N. W. from Newmarket. Population in 1841, 6825, The venerable Bede derives its name from the vast quantities of eels taken in the low fen grounds previous to and in his time, when they were not embanked or drained. The town consists principally of one long street, from which other smaller ones branch; nearly in the centre is a tolerably spacious market place. The shire hall, or court house, is a convenient building, having a centre and two wings; the former contains apartments for holding the courts—while the north wing is appropriated to the purposes of an infirmary, and the south is a chapel: a house of correction is behind the court house, and the common gaol is on one side of it. The district around Ely is strictly agricultural, and the manufactures of the city are neither various nor extensive; there are some potteries, and several oil mills. Gardening is pursued generally and prosperously; nearly twenty acres of land, in the two parishes, are appropriated to the growth of that delicate vegetable, asparagus, much of which is despatched to the London market; and by means of the river Ouse a considerable trade is carried on in corn and coal. The government of the town is vested in magistrates who are appointed by the bishop; they are five clerical and one lay, and are justices of peace within the isle—one of these exercises the duties of high sheriff. Assizes are held twice a year.

The most attractive object of Ely is its *cathedral*. A convent is said to have been built here about the year 673 by Ethelfreda, a daughter of one of the kings of east Anglia, and a famous saint of those days. It is supposed that remains of the sacred edifices then erected still exist in some of the prebendal houses in the neighbourhood of the present cathedral. It was not till the year 1109 that the bishopric of Ely was established; but the present church, which was then converted into a cathedral, or rather the original building of which the present church is an extension, had probably been founded some time before that event. Little, however, if any thing, beyond perhaps a portion of the foundation of the ancient abbey-church, remains in the present building. The oldest part of the cathedral is the transept, which appears to be of the early part of the twelfth century. The rest has been the work of successive ages. The nave is ascertained to have been finished some time before the year 1174. The whole wears the heavy features of the early Norman style. Between 1174 and 1189 the great western tower was erected by bishop Rydel. Its massive proportions still indicate the prevalence of the old idea of firmness and breadth as the principles of architectural effect; but the lighter and more ornamental character of the upper part of it, composed of successive tiers of small columns, and freely admitting the light through numerous windows, shows the change that was even then rapidly coming over the art. The elegant vestibule projecting from the line of the front, and formerly known by the name of the Galilee, was added about the close of the same century by bishop Eustachius.

The part of the church to the east of the transept was begun by bishop Hugh Northwold about 1234, and finished in 1250. During this interval also the present central tower was erected by the sub-prior of the convent, Alan de Walsingham, in the room of a former square-shaped tower, which had fallen on the 12th of February, 1322. The three most westerly arches of the nave had also been thrown down by this accident; and they too were restored by the liberality of the sub-prior. His expenditure upon the whole work was £2406 4s. 11d. The part of the cathedral immediately to the east of the central tower, which was originally called the presbytery, is now fitted up as the choir; but this is an alteration which was only made about the middle of the last century. The choir was formerly immediately under the tower. The interior of Ely cathedral is very magnificent. The vaulted roof of the nave is sixty feet from the floor, and now that the presbytery, or east end of the church, by being converted into the choir, has been added to the vista from the west end, an extent of prospect is produced corresponding to this altitude. Much of the tracery and other sculpture on the windows and pillars is also exceedingly rich and beautiful. In the great window of the east end of the church there is a painting of St Peter; and the delivery of the same apostle from prison by the angel is the subject of an old Italian painting, which has been considered to have much merit, over the altar. Various tombs and monumental chapels adorn different parts of the church.

EMIGRATION, (*a.*)

Account of the Number of Emigrants, specifying the Countries whence they came, and the Numbers from each, that arrived at Quebec during the Seven Years ending with 1835 —(Parl. Paper, *No.* 76, *Sess.* 1836.)

WHERE FROM	1829	1830	1831	1832	1833	[illegible]	1835
England and Wales	3,565	6.799	10,343	17,481	5,198	6,799	3,067
Ireland	9,614	18,300	34,133	28,204	12,013	19,206	7,108
Scotland	2,643	2,450	5,354	5,500	4,196	4,591	2,127
Hamburgh & Gibraltar	..	..	..	15			
Nova Scotia Newfoundland, West Indies, &c.	123	451	424	[illegible]	345	[illegible]	225
	15,945	28,000	50,254	51,746	21,752	30,935	12,527
				Grand Total		-	211,159

Account of the Number of Emigrants arrived at New York from the United Kingdom, separating between those from England, Scotland, and Ireland, during the Seven Years ending with 1835.—(Parl. Paper, ut supra.)

YEAR	ENGLAND	IRELAND	SCOTLAND	TOTAL
1829	8,110	2,443	948	11.501
1830	16,350	3,497	1,584	21,433
1831	13,808	6.721	2,078	22,607
1832	18,947	6,050	3 286	28,283
1833	..	..	..	16,100
1834	..	..	..	26,540
1835	..	..	..	16.749
		Grand Total	-	143,213

Return of the Number of Emigrants from the United Kingdom in 1833, 1834, *and* 1835, *specifying the Colonies and Countries for which they cleared out, and the Numbers that cleared out for each.*—(Parl. Paper, ut supra.)

	Colonies in North America.			United States of America.		
	1833	1834	1835	[illegible]	1834	1835
England	5,785	6,520	3,665	22,392	25.981	22,046
Scotland	5,592	4.954	2,450	1,953	2,880	1,990
Ireland	17,431	28,586	9,458	4,764	4,213	2,684
Totals	28,808	40,060	15,573	29,109	33,074	26,720

	Cape of Good Hope.			Australian Colonies.		
	1833	1834	1835	1833	1834	1835
England	516	287	325	3,317	2,666	1,746
Scotland	1	1	..	253	134	114
Ireland	..	..	..	23		
Totals	517	288	325	4,093	2,800	1,860

Total Number of Emigrants. in 1833, 62,527—in 1834, 76,222—in 1835, 44,488.

ENGRAVING. (*a.*) It is nearly four centuries since the art of Engraving was discovered, and a steady improvement may be discerned from that time up to the present day. The nineteenth century is rich in the productions of this beautiful branch of the fine arts. From every civilized land volumes are annually poured forth, illustrated and adorned in a manner which does indeed make antiquity appear rude. Men of genius are devoting themselves to the practice of the art, and do not disdain to perpetuate and spread over the world, by the burine, the inspired design which their pencil has traced. The noble works of the great masters are now no longer the exclusive property of a single spot, or a few individuals. They are given to the world, literally published for the benefit of society, and sent abroad into every land, to delight the taste and to inspire the genius of all nations.

The art of engraving is not, indeed, to be ranked on a level with that of painting. The conception of a piece, the sentiment, moral, or event to be represented, the grouping of the figures, the imagination of forms and countenances, all that belongs to creative power, is displayed in the original design. But still there is left a work for the engraver, demanding a high order of talent. How laborious, delicate, and minute is his labour; how fine, how almost imperceptible, are the millions of strokes, to which the finest hair seems coarse; how infinite the gradation from the deep and dark shadows to the delicate touch, on which the ink is to be laid so sparingly that the black shall literally appear white! And yet how bold and decided must his touch be; life, and even a glow of fire, all the varied expressions of the "human face divine," all the spirit that can light up the most gorgeous painting, must be transmitted through the graver. And more than this. The engraver is often called upon to improve upon his copy; to give, perhaps, to the rude, hard outline of ancient and imperfect drawing the roundness, grace, and fire of life; to supply strength and boldness, to give dignity and sentiment, to inspire the quaintness of ancient art with the grace of a better period, and at the same time to preserve the gothic and sublime simplicity of the original. In addition to this, in most of the copies which engravers are called upon to make, they are obliged to diminish very greatly the size of the piece. And, in doing this, they must not only give a much greater degree of delicacy to the work, and devote much more time to minute detail, but they must carefully preserve the original proportions of the piece. Finally, the engraver must, merely by the management of his lines, convey, in some degree at least, the idea of colour. For engraving seems, in this respect, to be the point of meeting between painting and sculpture. It does not exclude the idea of colour, like statuary, which consults form alone. It does not, like painting, give the detail of colour. Yet it must convey the notion of different hues, because otherwise no small portion of its purposes would be unfulfilled. The variety of subjects is much greater for engraving than for sculpture. It is intended to represent familiar and domestic scenes. It is not confined to austere and dignified representations. It enters into every sphere of life, every occupation, from the splendid dramas of the palace and the gorgeous array of the church, to the interior of the hovel, the ale-house, and the stable. To exclude the idea of colour from such representations would destroy the effect. Yet this can be conveyed in engravings only by implication or suggestion; by so managing the width and direction of the lines, that we suppose one colour to be represented in one place, another in another place, and so on. This power of the art is remarkably displayed in engravings of landscapes, in which the various hues of nature may be readily suggested to the imagination. All the varieties of foliage, even blossoms and flowers, the clear stream or lake reflecting the heavens, the gleam of the parting sun upon the waters, even the gorgeous drapery of the sunset sky, may be pictured by this charming art.

In speaking of the power of engraving, we must not omit to notice its beautiful adaptation to imitate that most difficult branch of painting, the representation of flesh-colour. Here engraving seems to achieve its highest triumph. Every variety of the appearance of flesh, the beautiful smoothness and delicacy of youth, the rough and wrinkled look of age, the hard and weather-worn visage of the seaman, the bright glow of childhood, and the softness of infancy, may be all conveyed by the engraver with scarcely less distinctness than in the finished painting.

Another very important and difficult office of the art is to convey, in the copies from paintings, a correct idea of the style of each great master; for the capacities of the art undoubtedly are sufficient for this purpose. In effecting this important object, it is obvious, that the engraver must be more than a mere copyist. It is not enough to imitate the outline and the shading, to preserve on a smaller scale the just proportions of the original, to convey a notion of the colouring, to give the same expression to countenances, and the same finish to all the detail. A higher order of talent is required in the engraver. He must be able to comprehend and appreciate the genius of the master, whose work is before him. He must understand the feelings which inspired him at the moment when he was pouring out his soul upon the canvas. He must know the enthusiasm that stirred him up, the profound sentiment that filled his heart, the devotion, piety, and ardour, with which he applied himself to the work. He must catch a spark of that heavenly flame, which burned in the soul of the great artist, and kindled into life the portraiture upon his canvass. In this way alone can he give to his work that nameless and ethereal charm, which, more than any thing else, distinguishes the works of genius.

These are some of the leading characteristics of the art of engraving; an art, which we consider perfect in its kind, that is, accomplishing all the objects which it professes to undertake, as completely as any of the fine arts. The editor of Horace Walpole's "Catalogue of Engravers" remarks, that "want of colouring is the capital deficience of prints." But we think he is entirely mistaken in this respect. Engravings, as we have endeavoured to show, do possess the property of colouring by suggestion, and this is one of the distinguishing beauties of the art. To colour a fine engraving, which is fully finished with all the depth and variety of shading, seems to us little less barbarous than to paint a fine statue.

The discovery of the art of engraving on metal, for the purpose of making impressions on paper, is generally ascribed to Finiguerra, a goldsmith of Florence. He excelled in an art, then much practised in Florence, called *niello*. It was the custom with jewellers, in those times, to engrave the outlines of Scripture subjects upon the vessels which they made for the use of the church. When this engraving was completed, they filled the lines with a black substance composed of a mixture of lead and silver, in solution with borax and sulphur; and impressions were taken from this in clay or sulphur. The black substance used was called *niello*; and hence the name of the art. The same process was also used when pieces of armour, household plate, and other articles, were engraved for the purpose of being inlaid with metals, wood, or ivory. Painters were employed to make designs for this kind of engraving, and impressions were taken in clay or sulphur, both for the convenience of the artist as he proceeded in his work, and for distribution among his friends. It occurred to Finiguerra, that the impression might be made on paper instead of clay; and he proceeded to make the experiment, wetting the paper and applying it gently with a roller. Impressions are still preserved in some of the museums of Italy, taken upon paper, and easily recognised by the inscriptions being reversed; and the Abbé Zani discovered at the Bibliothèque du Roi at Paris, in 1803, a print entitled "The first impression from an engraving by Maso Finiguerra in 1452." Some Italian writers, with considerable show of reason, place the epoch of Finiguerra's inventions as early as 1440, or a short time before. German writers claim the honour of the invention for a citizen of Antwerp, Martin Schoengaur, asserting that he practised the art before Finiguérra. It seems probable, that it appeared nearly simultaneously in both countries. The earliest distinguished engravers after the discovery of the art, however, were Italians.

It does not appear, that Finiguerra pursued his invention any further than to take impressions on paper instead of clay. A contemporary, of the same profession and city, Baccio Baldini, improved upon the invention by engraving on plates for the express purpose of taking impressions. He was greatly assisted by a distinguished painter, Antonio Pollajuolo, who furnished him with designs for his engravings, and also by another artist, Sandro Botticelli, who made a set of drawings, from which Baldini engraved plates for an edition of Dante, published in 1488, and supposed to be the first book ever embellished with copperplate engravings; though this notion has been proved false by a German writer.

The works of Baldini attracted the attention of a Roman engraver, Andrea Mantegna, who had already become distinguished as one of the most successful of the *niellatori*. This artist not only assisted Baldini with original designs, but also turned his own efforts to the promotion of the newly-discovered art, in which he soon became a proficient. Roscoe says of him, that his prints display considerable power of invention and expression of character, even bordering upon grace and elegance. The drawing is generally correct, and sometimes exhibits great freedom and spirit. His engravings are distinguished by the shadows being formed by diagonal lines, not crossed as in more recent prints.

In our notice of the early days of the art, we must not omit mentioning Albert Durer, one of the earliest Dutch engravers. Some knowledge of the art seems to have been previously possessed in Holland by Martin Schoengaur, who is thought by some German writers to have invented it, and who was certainly a contemporary of Finignerra. The works of Martin, and his disciple Wolgemuth, inspired the genius of Albert Durer, who did much for the improvement of the art, excelling equally on copper and on wood. Among his most famous works are portraits of the Emperor Maximilian; of Albert, elector of Mentz; of Philip Melancthon; a full length of Erasmus, who is represented standing at a desk, writing; a head of Ulric Vambuler, of the size of life; and a portrait of himself. He also executed a series of engravings on wood, thirty-six in number, representing scenes from the life of our Saviour.

We have mentioned these prints, because they exercised an important influence on the career of a young Italian, who was now successfully cultivating the same art, and who was destined to carry it to a much higher degree of excellence. Marc-Antonio Raimondi was born at Bologna, and studied the art of painting with Francesco Francia. He was early distinguished for his works in *niello*, but seems to have made no attempts at regular engraving until his attention was directed to it by accident. Having taken a journey to Venice, he saw for sale the set of prints, by Albert Durer, representing the life of our Saviour. These prints were held in high estimation, and sold at a very great price; but the young artist was so much tempted by them, that he could not refrain from the purchase, though it completely exhausted his funds. In order to repair his fortunes, he immediately began to make copies of Durer's pieces, which he executed with so much success in copper, that he was able to sell them in Venice, as originals by Durer. The latter, as Vasari tells the story, in his "Lives of Painters," on hearing of the fraud, immediately repaired to Venice, and complained to the senate of the injury; but obtained no other satisfaction, than a decree forbidding Marc-Antonio from affixing to his prints the name or emblem of Durer.

From Venice, Marc-Antonio went to Rome, where he had the good fortune to become acquainted with Raphael, who was then residing there. Having made an engraving from Raphael's Lucretia, he caused it to be shown to the artist, who immediately perceived the great advantage which he should enjoy by means of this invention, in having his works spread over the world; and from this time Antonio found his chief occupation in copying the works of this great master, receiving from him many useful hints and directions, so that the art was greatly improved by his labours. His reputation was soon established throughout Italy, and his school was resorted to by numerous disciples; among whom were Marco da Ravenna, Agostino Veneziano, and Giulio Bonasone, who were almost as accomplished and successful as their teacher, and did much to improve the taste of Europe.

The art was thus firmly established in Italy and in Holland. The first kind which was practised was the *line engraving*, as would naturally be supposed, when we remember the origin of the invention. And it is worthy of note, that, although many other ways have been adopted for cutting the copper, the earliest method is still used for the most costly and elaborate works. An account of the different modes of engraving will be found in the body of the Encyclopedia, under the present head.

There is a species of engraving on copper called the *medallic*, which has been invented within the last twenty-five years, and is so beautiful a branch of the art that it merits a minute description. The object of this kind of engraving is, to give accurate representations of medals, coins, and bassorilievos of a small size; and it is effected by applying a machine to the surface of the medal, which will trace a line on the copper corresponding exactly to the outline of the figure on the medal. Those who are familiar with a pentegraph will be able to form an idea of this machine. It is so contrived, that, as it slides over the surface of the coin, every elevation or depression which produces a perpendicular motion in the machine, causes at the same time a horizontal movement at the other extremity, which traces the line on the copper. Every time the machine passes over the coin, a single line is traced on the copper; and there is a delicately contrived screw, by which the machine may be pushed forward after each line is drawn, so as to make the next line as near to it as the operator chooses. The effect is to give an exact copy of the medal; and the drawing appears so salient, that we can hardly convince ourselves, at first, that we are looking upon a flat surface.

In the "Journal of the Franklin Institute of the State of Pennsylvania," (Vol. X. No. 3, for September, 1832,) we find some account of the invention, in the following passage:

"In 1817, by the use of a machine which had been invented in Philadelphia, Christian Gobrecht, die-sinker, produced upon copper an engraving from a medal having upon it the head of Alexander of Russia; from this engraving impressions were taken and distributed. One of these impressions we have seen. In 1819, Asa Spencer (now of the firm of Draper, Underwood & Co., bank-note engravers) took with him to London a machine of the kind above alluded to, which was principally designed for straight and waved-line ruling. This machine was used in London during the year just mentioned, and the mode of ruling waved lines, and of *copying medals*, was then exhibited and explained by Mr Spencer to several artists."

This branch of the art has received great attention both in England and France. Mr Bate of London, took out a patent for a machine of this kind, in 1826, and has distinguished himself by the beauty of his medallic engravings. In 1830, a mechanician of Paris, Achille Collas, contrived a similar instrument, having taken the hint from a machine which was used for engraving watch-dials, cases, and snuff-boxes, called the *tour à guillocher*. And in 1834, a publication was commenced in Paris, under the title of "Trésor de Numismatique et de Glyptique," which has been published weekly ever since, each part containing four folio plates of medallic engraving, and a sheet of letter-press.

ENLISTING; is the act of entering voluntarily into the military service of the state. All persons enlisted for the land service of Great Britain, must go, within four days, and not sooner than twenty-four hours after enlistment, along with an officer or soldier of the recruiting party, before a justice of the peace, or the chief magistrate of the place of enlistment, not being an officer of the army; and on that occasion the person enlisted is entitled to declare his dissent to the enlistment, and, on his returning the enlistment money, and paying twenty shillings for charges, and defraying any other expense he may have occasioned, he will be forthwith discharged. If he fail, within twenty-four hours after declaring his dissent, to return and pay the money, he is to be held as enlisted; and, in that case, or if he voluntarily enlists, the magistrate must then read, or cause to be read, to the recruit, the 3d and 4th articles of the second section, and the 1st article of the sixth section of the articles of war; and thereafter administer the oath of fidelity, and certain other oaths contained in the mutiny act. The magistrate certifies the enlisting and swearing, and the other particulars required by the mutiny act; and if the recruit refuse to take the oath of fidelity, the officer may detain him till he take it. In case the recruiting party has left the place, or if, from any other cause, an officer or soldier of the party cannot be found, the recruit may go by himself before the magistrate, within four days after enlistment, and before taking the oaths, and declare his dissent, and deposit the money in the hands of the magistrate. Persons receiving enlisting money, and absconding, or refusing to go before the magistrate, are held duly enlisted. If apprentices enlist, and state to the magistrate that they are not such, they may be punished by the judge ordinary for fraud, and, on expiration of their indentures, are liable to serve in the army. If they are bound for four years their masters, in Scotland, may recover them under certain conditions detailed in the mutiny act. If the master consent to the enlistment, he is entitled to part of the bounty. Servants enlisting before the expiration of the term of their engagements are, under the mutiny act, but not at common law, held to be validly enlisted, and are entitled to wages up to the date of their enlistment. Such are the usual provisions of the mutiny act on this subject; but, as that act is renewed annually, variations may occur; so that it is proper, on all occasions, to consult the existing act. By 9 Geo. II. c. 30, and 29 Geo. II. c. 17, it is declared a capital felony for any British subject to enlist as a soldier with any foreign state without her Majesty's leave; or for any person to procure a British subject to enlist, or to retain or hire him with intent to make him list, or procure him to embark or go beyond seas to be so enlisted; and this whether enlistment money has been paid or not. By 1 Vic. c. 29, the enlistment of foreigners into the British service is permitted, provided that, in any regiment, battalion or corps, their number shall not exceed the proportion of one to fifty, of natural-born subjects.

ENNIS; the county town of Clare, Ireland, is situated on the river Fergus, eighteen miles N.W. from Limerick, and 111 S.W. from Dublin. It is irregularly built, both the new and old parts of the town being scattered and ill-defined. It carries on a considerable trade in corn, butter, and other provisions. These are chiefly shipped at Clare, about two miles distant. Population in 1841 within the new electoral boundary, 9318.

ENNISCORTHY; a town in the county of Wexford, Ireland, situated on the river Slaney, sixty-two miles S.W. from Dublin. It has a picturesque appearance, but the streets are in general narrow and inconveniently steep. The chief trade of the place consists in the exportation of agricultural produce to Wexford, eleven miles distant, and also by land carriage to Waterford. In 1798 the town was besieged and plundered by the insurgents, who were ultimately defeated at Vinegar Hill in the vicinity. Population of the entire town and parish of Enniscorthy in 1841, 7345.

ENNISKILLEN; the chief town in the county of Fermanagh, Ireland, is situated on an island in the narrowest part of Lough Erne, eighty miles N.N.W. from Dublin. The site, accessible only by two opposite bridges, renders it very defensible, and enabled it to make its noble stand against the army of James II. The bravery displayed by the "Enniskillen men" on that occasion, led to the formation of the regiment of cavalry well known in our military annals by the name of the "Enniskillen dragoons." The town is in general well built, and besides the usual public buildings of an assize town, has a large infantry barrack, an artillery barrack, and two small forts. The chief trade is in timber, coal, and slate, imported from Ballyshannon to Belleek. A considerable trade in corn is also carried on, and the place forms the chief retail market for a large surrounding district. Population of town in 1831, 6796; of parish of Enniskillen, 13,777.

ENTOMOLOGY, (*a.*) The last twenty years have done much for the science of Entomology, in its nomenclature, in the addition of species of insects, and in their systematic arrangement, and, more than this combined, in rendering it a favourite and popular science, by the dispersion of prejudice and the diffusion of a taste for the investigation of objects so replete with all that can prove attractive. It seems hopeless to endeavour to arrive at any satisfactory conclusion relative to the probable number of the species of insects spread over the earth. Various calculations have been made, the discrepancies of which are perfectly ludicrous, if we view them without reference to the circumstances and data whence they were deduced. It appears plausible to argue from the materials in hand, namely, from any assiduously elaborated Fauna, upon the relative numbers of the different orders;—for some, the Coleoptera and Lepidoptera have been very generally the favourites, and consequently more carefully and universally collected than either of the other orders; but still the result will be far from conclusive, for such a Fauna will necessarily be of a country seated within the temperate zones; and to conclude thence upon the relative numbers of the orders within the tropical regions, and of countries so differently circumstanced both in climate and geological structure, is merely to hazard conjectures without the least hope of even an approximation to the truth. The data whence they must proceed are exceedingly incorrect; for the number of the two orders which should form the basis of the calculation have not, in those regions, been yet so nearly ascertained as to enable us to form a clear idea, the minute species having been hitherto very much neglected. It has been generally supposed that small insects are rare within the tropics and tropical climates, from their seldom being sent to Europe. That the reverse of this is closer to the truth, is clearly shown by a fact mentioned by Reich, who says that he commissioned two friends, one residing at Rio Janeiro and the other at Buenos Ayres, to collect all the minute Coleoptera they could find, and that, in consequence, he received from the latter place a four-ounce bottle filled with spirits, which contained 1200 minute insects, among which there were 116 new species—and from Rio a very small box, holding 216 impaled beetles, comprising 102 species, almost all of which were new and unknown—and from the same locality a half-ounce pill-box, which held 621 loose insects, consisting of more than 100 new species as small as any found in our more northern countries. It must be remarked, that in both instances they were collected at a very unpropitious time of the year, in the course of a few days, within a limited space, merely as specimens to ascertain if they were what the European friend desired; whence it is easy to conclude that they were not captured by Entomologists, who would necessarily have been aware of the interest attached to what they sent, and consequently, as well as knowing better where to seek, they would, in the same space and time, have caught probably five times as many. We may therefore consider, that minute species are as abundant in proportion to the larger ones within the tropics as they are in the colder regions; and if so in the Coleoptera, why not in the Lepidoptera, and then in their parasites, the pupivorous Hymenoptera and the parasitical Hymenoptera in general, which we know to be almost innumerable in Europe and in our own country, from the hosts already described by Gravenhorst, Nees, and our two able and assiduous compatriots, Messrs Walker and Halliday? The Diptera also will necessarily abound. Looking thence to the other orders, we do not feel so much astonished at the calculation made by Reich, who estimates the number of the species of insects at possibly a million. This multitude seems vast; but compare it with the number of individuals of a single species frequently observed; the myriads of minute gnats occasionally seen sporting over pools and under trees; the infinite hosts of ephemera that by myriads of millions emerge, at a certain season of the year, from some of the rivers of France, as described by Reaumur; the clouds of locusts, which even intercept the rays of the sun, and devastate whole provinces, and in the course of a few hours transform a smiling and fertile country into a wild waste and desert, threatening its whole population with famine; the innumerable plant-lice which desolate our hop-grounds, and their enemies the lady-birds, which have been taken up by pailfuls upon our coasts, and have completely covered the ocean at some distance from land; and the number of the inhabitants found in the bee-hive, the ant-hill, and the white ants' nest. If nature, in frequent instances, has rendered species thus prolific in individuals for peculiar purposes, can we rationally doubt her capacity of being equally fruitful in the production of species, when we take into consideration the important variety of their functions, and the very varied nature of soil and temperature, of heat combined with humidity and dryness, and the dissimilitude of organization resulting from these differences of combination; and when we reflect that in our own country every day almost adds to our indigenous tribes, although they have been assiduously collected for many years past,—a million therefore appears to us to be no exaggerated calculation of their probable number.

Their geographical and local distribution, also, are points to which very considerable interest attaches, the former being indicative of the effect of climate and temperature upon form, as well as showing how widely nature spreads some for certain purposes; whereas she adopts the use of analogical form and structure in other instances; clearly showing, by this variety, that a difference of function is required where we do not perceive even a modification of its action; whereas their local distribution is evidently very intimately connected with their instinct and economy—in fact, wholly influenced by them. The science possesses some very valuable but partial contributions to both. It is merely necessary to indicate Klug's description of some insects from Java; M'Leay and Horsfield's Annulosa Javanica; Savigny's admirable plates to the large work on Egypt, which, if we possessed the descriptions to the figures, would not be surpassed in the annals of entomology; Palissot de Beauvois' Insectes Récueillis en Afrique et en Amerique; Spix and Martius' Delectus Animalium Articulatorum, and, as an example of assiduity and labour, displaying the richness of the Fauna Insectorum of a single country, we should look in vain for a more valuable one than is to be found in Stephens' "Illustration of British Entomology."

Our systems are essentially artificial, and must long remain so; but this is very immaterial if they facilitate the ready recognition of described species. The value of a system in the present state of our knowledge must be limited to that object, that there may be no difficulty or error in recording, in connection with the identical species, whatsoever observations—whether anatomical, physiological or economical—may have been made upon it. A true natural system must be founded upon such a mass of knowledge that we can never hope thoroughly to possess it; for even when we shall have arrived at an intimate acquaintance with their external and internal organization, much still remains to be done. Something may be contributed by analogy, but which it is not safe to trust to until fully confirmed; for nature is frequently apparently eccentric, from the impossibility of our arriving at correct conclusions as to the relative effects of the complicated combinations of organization, and their mutual dependence upon the instincts and habits of the creatures. Indeed, in those systems which are most profuse in their professions of adhering to nature, we remark the strange incongruity of no value being given to instinct; and that creatures with instincts limited to self-preservation and the propagation of the species, assume an undue superiority, from the mere circumstance of having an organ or two more elaborately constructed in the mouth, over such as possess a highly developed instinct, and live in a peculiarly organized social state, which necessarily implies the power of communicating ideas and a certain degree of ratiocination.

It is here perhaps the most convenient place to take a cursory notice of the doctrine of circular affinities, intended to supersede, as more natural, the older one of linear gradation, in the distribution of organized beings. Mr M'Leay, the celebrated author of this system, conceives that the arrangement must be made in a series of circles, each composed of five groups, which are the affinities, and the corresponding groups of the approximate circles the analogies of organization; and by this means the whole series of created beings are linked together in closer connection than by any other mode of distribution. The idea is exceedingly attractive; but although it apparently in some instances fulfils our expectations, yet in others the distortions are so palpable, that we are surprised that the learned author himself seriously adopted it. The different combinations and structure of organs very distinctly produce a reticulation of relations; but to circumscribe nature within a circle, and that circle composed merely of five members, is to straiten her capacity too closely; for she, to use the words of Huber, "*a varié a l'infini ses combinaisons.*" The most obvious mischief produced by the promulgation of such doctrines is to withdraw ardent and enthusiastic minds from the laborious and steady observation of nature—from which alone we can derive true knowledge—to the pursuit of a phantom, which, when overtaken, melts in our arms.

In connection with our observations upon system, we may here remark upon the apparently ambiguous division of genera, with respect to the number of species they contain, and which scarcely accords with the precision and steady progression of nature, and is, perhaps, strong presumptive evidence of all but specific separation being unnatural. It may possibly be argued that their function in the universal economy requires it, from nature varying her usual mode of making a species excessively prolific where she requires a more powerful action; and to that effect, which only a certain organization can produce, she is limited, by causes which we are unable to investigate, in her power of executing by means of one agent, and consequently has recourse to several species to enable her to perform what, in other cases, under different circumstances, she can do by means of one alone; but this, although the best reason which occurs to us, is very vague, and far from satisfactory.

The progress of Entomology has been accelerated chiefly by the revision of the systematic arrangement, and its improved distribution into families, by the vast addition of species constantly making, and the many valuable monographs with which the science has been enriched. It is utterly impossible that we should here enumerate the multiplicity of works that have been published upon the subject. Those of Latreille, whom the science has so recently lost, will always necessarily rank pre-eminent among them. It was, doubtless, by the impulse given by his labours, that the science has advanced to its present state of comparative perfection. He was the first who indicated the distribution of insects into families, in his "*Precis des Caracteres Generiques*," from which time, in each subsequent work, he has progressively remodified and improved it, up to the publication of his "*Familles Naturelles*," in 1825. His portion of the second edition of Cuvier's "*Regne Animal*," published in 1829, presents us with the best general synopsis of the science, up to the date of its publication, that we yet possess. The science will long deplore the loss of Illiger and Leach, whose early labours gave such earnest of future valuable service. We must not omit to notice among the benefactors of the science, our venerable Kirby, and that joint labour of love, his and Spence's "Introduction to Entomology," which, perhaps, more than any other work ever published, has tended to make votaries to its study. M'Leay's name, also, will necessarily occur, to whom, if even his theories are not adopted, we must feel grateful for the utility of his practical labours. We must not, either, omit mentioning Gravenhorst, for the sake of his labours upon the Staphylinidæ, and his great work, the "*Ichneumonologia Europæa*," which he had in progress for twenty-five years, and which contains 2914 8vo. pages, and the description and scientific arrangement of 1288 insects of a tribe, the impracticable nature of which was previously insurmountable to every individual who attempted them. Nor must we forget Meigen for his systematic description of the European Diptera, which cost him fourteen years' labour. In its anatomical and physiological departments, the labours of Straus-Durckheim, Chabrier, Leon Dufour, Audouin, Marcel de Serres, Carus, Treviranus, Müller, Suckow, and a multitude of others, dispersed throughout the numerous periodicals and transactions of the various scientific societies, have done much to illustrate the subject.

EOCENE PERIOD; one of the divisions of the tertiary epoch, according to Mr Lyell's system, from ἠως, *aurora*, and καινος, *recens*, the commencement or dawn of the existing state of the animate creation. It includes, of *Marine* beds, the Paris and London basins; *Freshwater* beds, alternating with marine, in Paris basin, isle of Wight, Cacurbrine in Auvergne, Cantal and Velay; and the oldest volcanic rocks in Auvergne. Of 1238 fossil shells which have been ascertained in this formation, only forty-two are of living species, or about 3½ per cent. None of the associated remains of the mammalia found in these deposits belong to living species; about forty belonged to the division Pachydermata, which has now only four living representations on the globe.

EPWORTH; a market-town and parish in Lincolnshire, 160 miles N.W. from London. The chief employment of the inhabitants is in the dressing of flax, large quantities of which are grown in the neighbourhood. The parish is the birth-place of John Wesley, the founder of the Methodists. His father held the rectory of it for about sixty years. Population in 1841, 1843.

ERASTIANS; a party in ecclesiastical polity, who maintain that the church possesses no power in itself, and that the office of her rulers consists solely in instructing and persuading the people; that all they have a right to do, is to propose truths to be believed, and duties to be practised, which they may enforce by motives calculated to impress their consciences and hearts; but that they have no authority to call them to account for their conduct, and to deprive such as they deem unworthy, of their privileges. Such authority churches have possessed, and still may possess, but only as having it conferred by the civil power, or being tolerated by it in the exercise of an assumed right. Such authority a state may confer upon the church, for the purpose of maintaining due order in society, but it then only delegates what it has at all times a right to limit and control, and even to recal. And if a church shall, without such formal delegation, assume powers of government and discipline, it is an usurper, and unwarrantably encroaches on the authority of the magistrate; for the power of the sovereign is supreme in things both temporal and spiritual. These are the leading doctrines of Erastianism. Erastus promulgated them during the sixteenth century, chiefly at Heidelberg, and in his *Theses* and *Tractatus de Excommunicatione.* He was a physician, but devoted much of his attention to theology. His boldness in the interpretation of scripture, is as remarkable as his ingenuity in deriving arguments from natural law, and the principles of jurisprudence. The passage in Matt. xviii. 17, which apparently contradicts his favourite doctrine, he without difficulty interprets in a way confirmatory of it. The church, he says, means the assembly of the Jewish elders, the only legitimate magistracy among the Jewish people; and the verse just means that if private methods of getting justice failed, they were to carry the case before a Jewish tribunal; and if the culprit was obstinate, and refused to yield to the determination of such a court, he was to be treated as a heathen would be, and dragged before the Roman authorities.

Erastus never founded a sect, but his doctrines found patrons in many churches, and with the generality of princes. L. Molinæus was the most violent of the authors who have written in defence of them. To a certain extent they are acted upon in the church of England; and in opposing them the church of Scotland engaged in some of her most perilous struggles, and shed not a little of her best blood. The Reformed churches have loudly testified ,against them; but the Lutheran churches tamely yielded up their independence, and submitted to the Erastian yoke of the civil power. The consequences of what thus took place in these last named churches have been described by Dr Mosheim, who in general seems inclined to act as their apologist, and to explain away or conceal the evils to be found in them. Yet in this case the picture he gives is unfavourable. After describing the inroads and final triumph of Erastianism, he adds: "Nor will it appear surprising, when this is duly considered, that the manners of the Lutherans are so remarkably depraved, and that in a church which is deprived of almost all authority and discipline, multitudes affront the public by their audacious irregularities, and transgress, with a frontless impudence, through the prospect of impunity."

Erastus brought forward his doctrines as an effectual check to the tyranny of the church of Rome, and to that imitation of it which was to be found among Protestants. His doctrines, however, have never been properly systematized. Some hold that all established churches are necessarily chargeable with Erastianism; and among polemics, it is banded about from one party to another as a term of reproach. It is not to be wondered at that there are few churchmen inclined to speak favourably either of the name or of the thing signified by it. See *Turrettini Theologiæ, loc.* 18. *quæst.* 29. *Limborch Theologia, lib.* 7. *cap.* 18. *Dick's Lectures, vol.* iv. *p.* 385. *Mosheim, cent.* 16. *chap. I.*

ERRATIC BLOCKS, OR BOULDERS. Detached fragments of rocks, generally rounded and transported from a distance, are found in great numbers scattered over the earth's surface, and embedded in the diluvial covering. They vary in size, from a few pounds weight, to several tons. These stones are frequently accumulated near the masses from which they have been originally detached; but they are as often found scattered over districts at a distance, and various fragments of different rocks will thus be found accumulated and mingled together, sometimes at distances of many hundred miles from their parent rocks. These transportations point out the agency of currents, and immense irruptions of the ocean, passing over the land in particular directions, and with such impetus as to transport large and ponderous bodies. From the position of these boulders, the direction of such currents may often be distinctly ascertained. Thus in the valley of Mid Lothian, fragments from all the hills to the north westward are found accumulated on the south-eastern shores of the frith. In Switzerland immense granite blocks from the Alps rest on the limestone strata of Mount Jura, and fragments from the Scandinavian rocks in the north occur in great numbers strewed over the south of Europe. The same indications of a transport of boulders from north to south, is also to be seen on the continent of America. When fragments of rocks have been surrounded with ice, and a thaw has taken place, they have been thus rendered so buoyant as to float in water, and in this manner partial transportations of boulders may be accounted for.

ESCARPMENT; a geological term for the abrupt face of a ridge of high land; from the French, *escarper*, to cut deep.

ESQUIMAUX, (*a.*) The Esquimaux are extensively spread. Richardson and Franklin found them along the whole coast of the American Polar Sea; Kotzebue in the channel near Behring's Straits. Their stature is much lower than the European, five feet nine inches being considered gigantic; the usual height is from four to five feet. Though the trunk of the body is thick, the extremities are small, especially the hands and feet, and the fingers very short. The face is broad and flat, and the nose small, and sunk very deep: this would appear to be caused by the muscles of the face being drawn in from intense cold. The females have a fresh and good-natured expression of countenance. Their dress is very simple. That of the men is of a double coat of deer skin, with the hair inwards; at one end a hood is formed, and raised over the head; trowsers of the same, also double, falling over the boots which extend to the knee, which are of deer-skin or of the hide of the walrus or seal. The dress of the females is very similar; they are, however, distinguished by their boots,—so capacious, as to make each leg appear as large as the body, and to give them a waddling gait; these boots form a receptacle for all the nicknacks that may come into the possession of these fair orders of the north; and, in fact, answer the purpose of a "*reticule.*" Captain Parry states, that they were originally used for a receptacle for children, but that of late a new fashioned hood has been introduced.

Their clothes are sewn together with the thread consisting of the sinews of animals; they arrange their dress with some taste; and, from the rich variety of furs, the most showy of which the ladies turn into borders, they, on gala days, make a splendid appearance. But the taste of some was not so good; in lieu of beads they sometimes form ornamental girdles of the teeth of the fox, wolf, or musk ox; and one, to be finer than the rest, had fringed her jacket with a long row of *foxes' noses:* these were however suspected to be regarded as amulets or charms. To complete their beauty, the women paint their skin by drawing a needle under the epidermis, with a thread dipped in lampblack and oil; and after sewing and drawing out the needle, and pressing the part, it leaves a permanent olive tint.

Hunting is the only resource of these poor people; they pass their whole lives in adventure, which forms a determined character. When not able to procure wood or iron, their ingenuity turns the bones of animals into their implements; and their cord or line is formed by cutting the toughest and most elastic skins into long strips. The short period of summer is employed in shooting the deer with bow and arrow, the flesh of which for eating, and the hide for clothing, they highly esteem. The eider and other wild ducks also furnish them with food, and their skins, with feathers inwards, are used as clothing also. Winter drives all the animals to the south, and then these people are forced to subsist from the products of the river—the seal, the walrus, and the whale—which are obliged to ascend to the surface for respiration. In a solitary snow shed, erected on purpose, they watch, and immediately the animal is visible, strike a dart or harpoon with a line attached. When struck, it plunges into the water, but forced to return at intervals, is again attacked, till, by loss of blood and fatigue, it becomes an easy prey. With a band of dogs, a single Esquimaux will attack a polar bear; the dogs keep him at bay, while the master, advancing with a spear, and avoiding with incredible agility the springs of the bear, pierces him repeatedly, till, exhausted, he falls and dies. Nooses, springs, and traps are also used to catch birds and foxes. Immediately a walrus or other sea monster is taken, shouts are raised throughout the village of huts, when they all come out, and immediately it is brought before them, slices are cut out, and every lamp has a fresh supply of oil; the huts are in a blaze of light; all the pots are filled with the flesh, and the women begin cooking, occasionally picking out a dainty morsel for themselves; the feast is now prepared, when, seated round, one man takes up a larger piece, and severs, with his teeth, as much as he can get into his mouth, and then passes it to his neighbour, and so on all round till it is consumed, and a fresh piece is supplied: they will sometimes devour the whole of the animal at one sitting. A youth, named *Toolooak*, is said to have eaten in the Fury, within twenty-four hours, ten pounds four ounces of solid food, a gallon and a pint of water, with more than a pint of soup. Captain Lyon, however, thought *Kanzara*, another native, possessed more capacity of stomach; in nineteen hours he finished nine pounds fifteen ounces of solid, and a gallon and a half of fluid. Such are the appetites of those people, and so improvident are they, that the most ample stores soon disappear; one day they are labouring under all the evils of repletion, and a few days after they are without food.

Their intellectual faculties are not, of course, much developed; they cannot count beyond ten, and can form no abstract ideas; but in the mechanical structure of their huts and implements, they display great skill; from constantly migrating, they have a good notion of delineating geography; they are very humorous, and fond of mimicking. The first winter they appeared to be honest in the extreme; but, after two or three winters, being accustomed to see pieces of iron, tin pots, and pieces of wood and planks, lying about, all to them, as gold and jewels to the people of the south, they, by degrees, yielded to the temptation of pilfering; this may, however, in some degree be excused, after they discovered that in their early intercourse with the strangers, skins and furs of great value had been exchanged by them for beads and other articles of little value; for among themselves the greatest integrity appeared to be observed, their sledges and implements of hunting being left outside their huts without any suspicion of their losing anything. Hospitality was a virtue they also possessed; the strangers from the south were admitted freely into their huts, and the women waited upon them with the greatest attention, setting the best food they had before them, as well as mending and drying their clothes. "The women working and singing, their husbands quietly mending their lines, the children playing before the door, and the pot boiling over the blaze of a cheerful lamp," presents a scene of civilized happiness little imagined to exist in such desolate regions, and cheering in the highest degree to the wandering voyager.

Their religious customs are curious; their principal deity is called *Aywillaiyoo*, being the figure of a female of gigantic stature, having only one eye (the left), and a *pigtail* reaching to the knees, and so large that both hands can scarcely grasp it. Captain Lyon was present when *Toolemak*, their chief magician, summoned *Aywillaiyoo* to the upper world to utter her oracles. They were all assembled in a hut, and light after light was extinguished till total darkness prevailed. Toolemak, with incantations, then pretended to descend to the world of spirits to bring up the oracle. Shortly afterwards a low chaunt was heard, supposed to be the voice of *Aywillaiyoo*. For half an hour, screams and questions were uttered by her votaries, and even replied to in mystical answers, after which the sound died away, and she was supposed to disappear, when Toolemak cautiously announced his return to the upper world. The magician was taken on board one of the vessels, and, after being heated with nine glasses of *hot water* (brandy), influenced by the spirit, began to act over again; when it appeared by various modes of applying the hand or jacket to the mouth, he produced those sounds which had passed off for the incantations of *Aywillaiyoo*. This deity is supposed to have a father, who is a giant with one arm. The Esquimaux also have a more familiar spirit, called *Pamiooli*, a kind of Mercury among them frequently invoked; they likewise mention a large bear, which they say inhabits the centre of the ice, and sometimes holds converse with them. They, however, believe in a future state, in which, as usual among savage nations, they imagine the senses will be completely amused. They believe that the soul passes through different abodes, first into a state similar to purgatory; that the good spirits pass through them, and find their state continually improving until they reach a spot *where the sun never sets*, and where, with plenty of water and a beautiful country by the side of lakes which never freeze, the deer roam in vast herds, and the seal and the walrus abound. Such is with them the perfection of bliss.

Captain Parry gives the following description of the manner in which the Esquimaux dogs draw the sledge:

"When drawing a sledge, the dogs have a simple harness (*annoo*) of deer or seal-skin, growing round the neck by one bight, and another for each of the fore-legs, with a single thong leading over the back, and attached to the sledge as a trace. Though they appear at first sight to be huddled together without regard to regularity, there is, in fact, considerable attention paid to their arrangement, particularly in the selection of a dog of peculiar spirit and sagacity, who is allowed, by a longer trace, to precede the rest as leader, and to whom, in turning to the right or left, the driver usually addresses himself. This choice is made without regard to age or sex; and the rest of the dogs take precedency according to their training or sagacity, the least effective being put nearest the sledge. The leader is usually from eighteen to twenty feet from the fore part of the sledge, and the hindmost dog about half that distance; so that when ten or twelve are running together, several are nearly abreast of each other. The driver sits quite low, on the fore part of the sledge, with his feet overhanging the snow on one side, and having in his hand a whip, of which the handle, made either of wood, bone, or whalebone, is eighteen inches, and the lash more than as many feet, in length; the part of the thong next the handle is platted a little way down to stiffen it, and give it a spring, on which much of its use depends; and that which composes the lash is chewed by the women, to make it flexible in frosty weather. The men acquire from their youth considerable expertness in the use of this whip, the lash of which is left to trail along the ground by the side of the sledge, and with which they can inflict a very severe blow on any dog at pleasure. In directing the sledge, the whip acts no very essential part, the driver for this purpose using certain words, as the carters do with us, to make the dogs turn more to the right or left. To these a good leader attends with admirable precision, especially if his own name be repeated at the same time, looking behind over his shoulder with great earnestness, as if listening to the directions of the driver. On a beaten track, or even where a single foot or sledge-mark is occasionally discernible, there is not the slightest trouble in guiding the dogs: for even in the darkest night, and in the heaviest snow-drift, there is little or no danger of their losing the road, the leader keeping his nose near the ground, and directing the rest with wonderful sagacity."

EUPIONE; (from *ευ*, good, and *πιων*, fat, or oil;) a highly volatile and inflammable liquid, extracted from oil of tar by repeated rectifications, aided by the action of concentrated sulphuric acid. It has the lowest specific gravity of any known liquid, viz., 0·65. When pure, it burns without smoke, and with a very brilliant white flame.

EVESHAM; a borough-town in Worcestershire, situated on the banks of the Avon, ninety-five miles N.W. from London, and sixteen S.E. from Worcester. Gardening forms the principal employment of the inhabitants, the vale of Evesham being noted for its fertility. Stocking-weaving is also carried on to some extent. Evesham is noted in English history as the site of a battle fought on the 6th August, 1265, between the forces of Henry III., commanded by prince Edward, and Simeon de Montfort, earl of Lincoln, which issued in the defeat of the earl, and the release of the king and his reinstatement on the throne. Population in 1831, 3991.

EXCISE, (*a.*) In consequence of the injurious interference of the excise regulations with the processes of many of our manufactures, that branch of national taxation has lately undergone considerable investigation. On the 27th March, 1833, Sir Henry Parnell, Bart., Henry Berens, and Henry Lewis Wickham, Esqrs., were appointed commissioners, to inquire into the establishment of the department of excise, and into the management and collection of the excise revenue throughout the United Kingdom. On the 26th July, 1833, the commissioners made their first report, and on the 12th July, 1836, their twentieth and last. Their secretary, Mr T. C. Harrison, has since made a *Digest* of these twenty reports.

Many of their suggestions have been already made the subjects of legislative enactments, viz.: 1. The abolition of the surveys and permits, as regards tea, wine, and tobacco. 2. The modification of the survey of brewers. 3. The repeal of the duties on stone bottles and sweets. 4. The limitation against shipping spirits from Scotland in less quantities than eighty gallons reduced to twenty gallons. 5. The reduction of duty on spirits in Ireland, from 3s. 4d. to 2s. 4d. per gallon. 6. The repeal of the duty on starch, and the relief of the manufacturers from excise regulations. 7. The reduction of the duty on flint glass from 6d. to 2d. per lb. 8. The consolidation of the two classes of paper into one, with one rate of duty. 9. The duty on first class paper reduced from 3d. to 1½d. per lb., being the amount payable on second class paper. 10. Consolidation of the separate classes of pasteboard, subject to one duty of 14s. per cwt. 11. Repeal of duty on stained paper.

The following reductions have also been effected in the establishment and expenditure of the excise department, in consequence of the adoption of the recommendations of the commissioners, either wholly or in part, under these several heads, viz.:—

	No. of officers.	Amount of salaries, per annum. £	s.	d.
On the abolition of duties on starch, stone bottles, and sweets .	7	680	0	0
On the modification of the survey on tea-dealers . .	142	14,967	5	0
On the abolition of the survey on wine-dealers . . .	40	4,033	5	0
On the modification of the survey on brewers . . .	84	8 440	0	0
	273	£28,120	10	0

There are ten articles which are now the subjects of excise taxation, viz.:—

1. Spirits.
2. Malt.
3. Hops.
4. Paper.
5. Soap.
6. Glass.
7. Bricks.
8. Vinegar.
9. Auctions.
10. Licenses.

The commissioners consider the three first articles—spirits, malt, and hopes—as *luxuries*, and as a class of articles affording one of the least objectionable sources from which this species of taxation can be supplied. But they regard the five succeeding articles, namely, paper, soap, glass, bricks, and vinegar, as articles of *useful manufacture;* and consider that a tax imposed on them is liable to the strongest objections. Instances are given of the injurious effects which the excise regulations produce, by interfering with the ingenuity, skill, and resources of the manufacturer.

To facilitate the great labours which devolve upon the excise establishment in the charging and collection of this branch of the revenue, the country is partitioned into convenient portions, in each of which is organized a certain number of the officers of excise of various ranks, who perform the necessary duties of charging the duties, of supervising the operations of excise traders and manufacturers, and of collecting the duties within the circuit allotted to them. England and Wales are divided into fifty-five great parts, which are known under the name of "collections." Some of these extend into several counties, and all are more or less limited according to the density of the population. The name of a county, a large portion or the whole of which is comprised within their limits, is given to some collections; and others are known by the name of some great town which they contain. Wales is divided into four collections. The London collection, which includes the district within the limits of the chief office, is placed on a different footing from the country collections, in consequence of this contiguity, and also of the magnitude of its operations.

Each collection is divided into districts, usually into six or seven, though there are four collections which only contain four districts, and on the other hand the Leeds collection contains eight. The total number of districts in England and Wales is 315. Each district again is subdivided into rides and foot-walks, or divisions. A ride comprises a tract of country in which the traders are thinly scattered, and the officer is required to keep a horse. The number of miles travelled daily by a ride officer is not less than eighteen on an average. In towns, the circuit which contains so many excise trades and manufactures as require the constant attention of one officer, is necessarily circumscribed, and, therefore, as it can most conveniently be visited on foot, it is termed a foot-walk or division. Wherever the population is dense, there will always be a sufficient number of traders and manufacturers residing within a short space, and whose operations require to be constantly surveyed, as to render the foot-walk a more convenient division than the ride. A foot-walk never exceeds a circuit of sixteen miles, as the officer would then require a horse.

The chief officer of each collection is the collector, who is allowed a clerk; and in two or three collections more than one clerk is required. The supervisor is in charge of a district, and is the next officer in point of rank, and afterwards come the ordinary surveying officers. There is always one supernumerary in each collection, and in many there are officers called assistants and expectants.

The business of the collector is to attend each market-town in his collection eight times during every year, to receive the duties payable in the town and neighbourhood. He is attended by the supervisors and officers, and examines the diaries kept by the former, which contain an account of the daily occupation of their time, and a statement of such errors and omissions as the supervisor may have discovered on the part of officers. The collector hears the explanations of the officers, and writes his own view of the case in the same diary, to which the supervisor and officers put their initials if they agree in the view taken by the collector; and if they do not agree, they are required to state the grounds of their dissent in writing. The use made of these diaries will be subsequently noticed. The proceedings of the collector operate as a check upon the supervisor, and the latter is a check upon the subordinate officers. The collector is also employed in hearing information, and he is also required to pay the out-pensioners of Chelsea hospital. An allowance is made under the head of sitting expenses, in order to provide for the extra payments which he is called upon to make when on his rounds. In 1835 these expenses amounted to £20,000.

The supervisor has charge of a district, comprising a certain number of ride and division or foot-walk officers, whose proceedings he constantly checks by surveying, at uncertain times, the same premises. He examines their accounts, keeps a diary, in which he inserts the particulars of his own surveys and the errors which he may have discovered in the calculations of the surveying officer. Supervisors are often occupied fifteen hours a day; and when on duty in a riding district, the number of miles travelled daily averages twenty-three. The labours of the supervisor are both arduous and multifarious.

The class known as officers constitutes the chief strength of the surveying department. They are employed to survey the excise traders and manufacturers either in a ride or a foot-walk. The manufacturers and traders give notice to the officer whenever they are about to commence an operation which demands their attendance, and he must be on the premises at whatever hour may be fixed. The officer is frequently on a survey at three o'clock in the morning, or as late as ten or eleven at night. He not only takes accurate surveys of manufacturing processes, but is called upon to keep an account of the stock of every dealer in exciseable articles within his circuit. It is of the utmost importance to all who are subject to the excise laws, that the officers entrusted with their execution should discharge their duty so as to cause as little annoyance and inconvenience as possible; and it is right to state that they generally succeed in accomplishing this object, acting with impartiality towards all parties. Every officer is subject to a most rigorous system of inspection by the supervisor under whom he is placed. Before going out on each day's survey, he is required to leave a memorandum behind him, specifying the different places he is about to visit in the course of the day, and the order in which he will visit them. It is the business of the supervisor to make his survey without any previous notice, and the officer is never certain that he will not re-survey the premises which he has just gone over. This vigilance ensures fidelity to the public service, which is further promoted by the officer being obliged to keep a minute record of every survey and every particular connected with it, stating the hour and minute when it was commenced. The supervisor who checks his proceedings is obliged to enter into his diary every error he discovers. The books of both supervisors and officers are deposited at the chief office in London, and neither class can advance in the service without a reference to them and a strict examination into their accuracy.

The assistant is an officer, whose duty it is to watch the operations of a single trader, as a soapmaker, or any manufactory in which the constant presence of an officer is necessary. This class also is employed in relieving the officers of a ride or foot-walk at those seasons of the year when the operations of the excise traders are most active.

The supernumerary attends the collector on the rounds which he makes eight times a year. He carries the official papers and documents, and is required to provide himself with a horse. He also officiates for officers who are sick. The supernumeraries and assistants are appointed to a ride or foot-walk as vacancies occur.

The expectants are individuals admitted into the service of the excise on the nomination either of the Treasury or the Board of Commissioners of Excise, the patronage being divided between them. Nearly three hundred expectants are appointed every year to supply the changes by deaths, promotions, and retirements. During the war it was frequently difficult to fill up vacancies, and officers were encouraged to introduce their sons into the service; but this difficulty is of course no longer felt. The age of the expectant must not be above thirty, nor below nineteen; and if married, he is ineligible if he has more than two children. A competent knowledge of vulgar and decimal arithmetic is necessary. On his first introduction into the service he is placed under the care of an experienced officer to receive instruction in his duties; and, as a pupil, he must continue under his care for a period, which must not be less than six weeks under any circumstances, and as much longer as necessary. He then receives a certificate of his qualifications from the supervisor, who examines him, and he is employed in doing duty for sick or absent officers, receiving a salary, which is very small when he is not on actual service.

The salaries of collectors vary from £350 to £550, according to the extent of their duties and responsibility. Only two collectors are in the enjoyment of the last named sum, and the salary of the majority is £400 a year. The salary of supervisors is £200; of officers £100; of assistants £85; of supernumeraries £52; of collector's clerks from £115 to £150, the salary of fifty-one out of sixty-one clerks being £140; and the salary of expectants is £50 a year. The officers are divided into two classes, though they each receive the same salary; but one class is obliged to find a horse. When the expectants are employed as such they receive an additional allowance at the rate of £30 a year; and supernumeraries, in like manner, receive an addition to their salaries of £38 a year. Most supervisors are obliged to keep a horse. The amount paid in salaries for the country establishment (England) was £365,487 in 1835. The collectors give security to the amount of £5000; supervisors provide a bond of £1000; and all other classes in the service give security to the amount of £200.

The total number of officers of each class on the country establishment (England) was 3186 in 1835, viz.: 55 collectors, 2 supernumerary collectors, 61 clerks, 316 supervisors, 1023 division or foot-walk officers, 1499 ride officers, 75 assistants, 54 supernumeraries, and 101 permit writers, besides expectants, who are unattached.

The board of excise is a sub-department charged with the collection and management of one branch of the general taxation of the country. It is not, though in practice it, as well as other boards of revenue have almost assumed to be, an independent department, instead of a sub-department, of the department of the lord high treasurer, and subject to the check and control of the lords of the treasury; the first lord of the treasury and the chancellor of the exchequer being the really responsible parties. The board consists of seven commissioners, who have equal authority and power. The chairman has a salary of £2000, the deputy chairman of £1500, and the other commissioners have £1200 per annum each. They appoint to offices, and pay the parties appointed such sums as are necessary; but the number of each description of officers is not allowed to exceed the number fixed by general warrant or order from the treasury. The duties transmitted by the collectors and others are paid every day by the board to the receiver-general of excise. The board is responsible for the general discipline of the service, amounting to about 7000 individuals. The correspondence with officers, traders, and the public, involves daily an average of 230 letters, or 69,000 letters per annum. It is not the practice of the board to give answers in writing to the letters of traders and manufacturers. The number of individuals employed at the chief office is 518, whose salaries amount to £102,872 per annum; or, including all other advantages or emoluments, to £106,052. The number of officers in each description of office is as follows:—The board, 7: secretaries, 20; correspondents, 14; correspondents for Scotland and Ireland, 16; solicitors, 13; solicitors for Scotland, 5; solicitors for Ireland, 6; registrars, 2; commmissioners of appeals, 5; receivers-general, 12; comptrollers of cash, 3; accountants, 48; accountants for Scotland, 11; accountants for Ireland, 13; comptrollers-general, 34; auditors, 8; security-office, 8; store-office, 10; inspectors of permit-paper 2; permit-examiners, 19; diary-office, 5; surveying general examiners, 112; London port establishment, other offices, including doorkeepers, messengers, housekeepers, 102. The principle of promoting to offices of importance men who are intimately acquainted with the practice of the excise in all its branches does not appear to have been adopted with sufficient strictness.

Since 1823, the Irish and Scotch boards have been consolidated with the English establishment. The powers of the Irish and Scotch commissioners, twelve in number, were distinct and independent of those of the English board. The business of the three countries was therefore managed by twenty-one commissioners, whose salaries amounted to £26,700; but it is now better conducted by a single board of seven commissioners; and the commissioners of inquiry are of opinion that the business would be still better performed if there were only one chief commissioner, as his responsibility would be greater. The duties of the excise establishment, both in Ireland and Scotland, are similar in principle to the English collections. Each country is divided into similar districts, and officers are removed from one country to the other. The number of officers of every description employed in Ireland was 618 in 1835; salaries £73,272. The police revenue force is peculiar to Ireland, and consisted of above 1000 men, whose object was to put a stop to illicit distillation. The commissioners of excise inquiry recommended that such a force should not be connected with the excise establishment. The number of collectors, supervisors, and officers in Scotland was 875 in 1835; salaries £95,195.

The board of excise recognizes as one of its most important responsibilities the duty of keeping the service in a state of efficiency. To attain this object, a systematic examination is made of the performances and proceedings of each individual officer before he can be advanced in rank; and the duties of the various classes of officers are allotted in such a manner as to render the officers a constant check upon each other. The collector is a check upon the supervisor; the supervisor upon the officer; and the vigilance of the surveying-general examiners, which is not permanent, but directed, without any previous intimation, on a given point, is intended to render the system still more perfect. An officer who has been three years employed, and two in a ride, may be promoted to a foot-walk; and after a service of nine years, three of which must be passed in a foot-walk, he is eligible for the office of supervisor. A supervisor who has been employed five years in that station, and who has been altogether fifteen years in the service, may be appointed to a collectorship. An officer is not promoted unless, having served for the time required in one grade, he petitions for advancement to another. But having petitioned, he subjects himself to a rigid examination of his conduct and official character. This is technically termed "taking out a character," and the diary-office is the department where this investigation takes place. In this office are deposited the diaries made out by surveying-general examiners and supervisors, showing the daily performances of every officer, and the acts of neglect or omission which have been discovered in the officers of every district, with the collector's observations. The clerks of the diary-office have all been appointed from supervisorships, as a practical acquaintance with the duties of officers is considered essential. The diaries are received and registered eight times every year. These diaries are read by the board, who censure or commend as the case may require. The diaries, on being returned to the proper office, are again registered, and the remarks made by the board on each are entered in a book provided for the purpose. These records of censure or admonition are preserved in the office, and a copy is sent to the proper collection. When an officer petitions for promotion, the diaries are searched, and his official character is taken out and furnished to the secretary. In the diary-office are also entered the age, number of family, time employed, time sick or absent, of every officer in the service. When a supervisor's character is taken out for promotion, his books for one year are examined, and the books of all the officers under him, for a quarter of a year, are examined also; all the accounts are recast, and if, in the books of the latter, errors are discovered, the supervisor is quite as responsible as if they had taken place in his own books; and a certain degree of neglect on his part would retard his promotion. This inquiry is conducted by the country examiners; and when this has been done, the investigation is taken up by a surveying-general examiner, for the purpose of ascertaining the disposal of the supervisor's time: whether it has been judiciously employed or not; whether he has been too long employed on a duty which ought to have occupied a shorter period, &c. Two months are required for completing the investigation; and when the report is laid before the board, the name of the officer is not given. When a ride or foot-walk officer applies for promotion, his books, for a period of three months only, are subjected to examination. Thus, when a vacancy in the service occurs by death or otherwise, the book in which applications are inserted for particular situations is examined, and next the official character of these individuals is taken into consideration, and promotion takes place without the officer's name being known. Personal application in favour of officers is not permitted, but is sure to prejudice their interests; and the excuse that it was made without the officer's knowledge is not admitted without a strict scrutiny. The surveying-general examiners are not employed at the chief office only, but proceed to the country, checking the performances of collectors, supervisors, and officers, officiating for absent collectors, and acting, with reference to excise traders, in the same manner as the supervisor, who checks the officers under him by coming upon them at unexpected times. It is a part of the system of discipline to remove officers when they have been stationed four years in one place. This plan was introduced by Mr Pitt; and about 1100 officers change their residence each year, at an average cost of above £4000. There are good reasons for believing that this part of the system is not advantageous to the service, while it often operates with great hardship upon the officers and their families. If an officer has once been in collusion with traders, he will be liable to corrupt the traders of the district to which he is removed, and with as little delay as possible; and on the other hand, the fraudulent trader of the district which he has just left will endeavour to corrupt the new officer.

EXETER, (*a.*) The city of Exeter, called by the Romans, *Isca Danmoniorum*, derives its name from the river Exe, on the sides of which it is built; Exe, Esk, or Wisk, being an old Celtic word signifying water. It is the same word which forms the first syllable of the Irish Usquebaugh and the Scotch Whiskey, both of which signify the "water of life." The original British name of the place, according to an old writer, was *Caerwisc*, which means the city of the water. It is also said to have been called at one period, from the number of monasteries within its walls, *Monkton*, and to have received from king Athelstan the name of *Exanceaster*. Bishop Godwin says, that the same monarch, in the year 922, founded a convent of Benedictine monks on the spot where the eastern part of the present cathedral stands; and there is an opinion, which, however, cannot be relied on, of a previous monastery having been established on this site by king Ethelred in 868. Athelstan's monastery did not last long, but was broken up, and its inmates expelled, by the attacks of the Danes. It was restored by Edgar; again destroyed by Sweyn, king of Denmark, in 1003, and afterwards rebuilt by Canute. But in 1050, Edward the confessor placed it on a new footing by removing the bishop's see from Crediton where it formerly was, to Exeter, uniting with it the see of St Germans (in Cornwall,) and making Leofric, who was also lord chancellor, the first bishop of Exeter. Thus the sees of Cornwall and Devon became united.

The cathedral, which is now called St Peter's, though anciently dedicated to St Peter and St Paul, is considered to have been at that time very small; about sixty feet long: it doubtless occupied a part of the site of the present building, but as the latter presents no certain signs of the architecture of so early a period, it is difficult to determine the ancient position. In 1107, bishop Warlewast, a Norman, began to enlarge Exeter cathedral suitably to the taste of his times. He laid the foundation of the choir; and it may reasonably be concluded, that he built the large north and south towers now remaining. In 1138, however, in consequence of the opposition of Rivers earl of Devon to the claims of king Stephen, Exeter was the scene of a dreadful siege, and on its being taken by the king's army, many buildings, including the cathedral, suffered by fire. Between the period of this siege and the appointment of bishop Quivil, in 1280 (142 years), considerable sums were laid out in repairs; but, it is probable that the structure had received such material injury, as to render a rebuilding of most of it necessary: accordingly Quivil is termed "the founder of the new work," and almost all writers on the subject have given him the credit of founding and designing the present spacious and beautiful cathedral. The entire length of the structure, including the walls, is 408 feet, breadth within 64, and height of the towers 160. It abounds with interesting monuments: the bishop's throne, sixty feet in height, is a specimen of magnificent tabernacle work. The cathedral is also remarkable for its organ, its bells, and its ancient astronomical clock. The clock is in the north tower, and is said to have been the gift of bishop Courtney, who occupied the see from 1478 to 1487. Mr Britton, however, in his "History of Exeter cathedral," has referred to some ancient authorities, from which it would appear that there was a famous clock here many years before the time of that bishop. The present clock, besides the hour of the day, indicates the age of the moon, and represents the revolution of that luminary around the earth. Its face is seven feet in diameter. In the north tower is also the famous bell, called the Peter, the largest in England except Great Tom of Christ's church, Oxford. The bell at Christ's church weighs 17,000 lbs., and this is said to weigh 12,500. Unfortunately, the Exeter bell is now so hung that it cannot be rung. It, as well as the clock, is said to be the gift of bishop Courtney; but Mr Britton, to whose work we are indebted for these particulars respecting it, is of opinion that it is probably of still greater antiquity. The tradition is, that it was brought from the cathedral of Llandaff. Having been cracked on the 5th of November, 1611, it was recast in 1676. The organ is said to be one of the most powerful in Europe. It was built by an English artist in 1665.

Exeter vies with most cities in charitable institutions. There also several literary societies, and some excellent public libraries. The earliest charter of the city was granted by Henry II., and succeeding monarchs confirmed or extended its privileges. Its civil government, previous to the municipal act in 1835, was vested in a mayor, eight aldermen, a sheriff, a town-clerk, and sixteen members of the town-council. By the new act the number of aldermen is increased to twelve and of councillors to thirty-six. The act also divided the borough into six wards, and bestowed upon it a commission of the peace.

The river Exe is navigable for vessels of 150 tons burden up to the quay, which is very spacious. At an early period in the history of Exeter, a water course or canal was made to communicate with the town and the estuary of the Exe. This underwent in the course of time various improvements, but still in 1819 was found so insufficient for the demands of commerce, that Mr Green, the county surveyor, was employed to survey it, and report its state. He was further instructed, in 1824, to examine the state of the river from the estuary to the city. From his reports it appears, he found that vessels drawing from twelve to fourteen feet of water could pass the bar, and ascend the Exe by the same tide as far as the Turf, which is more than a mile nearer the estuary of the Exe than the entrance to the old canal. He found also that by extending the canal to this place, and constructing a proper lock, such vessels as could pass that bar might proceed at once to Exeter, avoiding all lighterage, pilotage, and delays incidental to the discharging of their cargoes in the Bight of Exmouth. The suggestions and plans of Mr Green, having received the approval of the celebrated Telford, were adopted by the mayor and chamber, and in 1825 the work was commenced, which was finished in 1830. The sea-lock at Turf is 120 feet long, and 30 feet wide. The basin or dock, which prevents vessels losing time in consequence of the canal being so frequently closed on account of the floods of the river, is 917 feet in length and varies from 110 to 90 feet in breadth. Its uniform depth is eighteen feet, with commodious sites on its margin for wharfs, &c. The opening of it on the 29th Sept. 1830, was celebrated by the inhabitants of Exeter and the surrounding county with great demonstrations of festivity.

EXMOUTH, Admiral Lord Viscount, a distinguished naval officer, born on the 19th April, 1757. The father of lord Exmouth, whose name was Samuel Pellew, commanded the government packet-boat at Dover, where his son Edward was born. The boy went to sea at the age of thirteen, having lost his father five years before. The ship in which he began his career was the Juno frigate, and his first voyage was to the Falkland islands, at the extremity of South America. He was not engaged in active service till 1776, on the breaking out of the American war, when being sent out as midshipman in the Blonde frigate to Lake Champlain, he greatly distinguished himself in the course of that and the following year. The gallantry which he displayed on various occasions, obtained acknowledgments in the most flattering terms, both from lord Howe and general Burgoyne, the former of whom also gave him a lieutenant's commission. On the surrender of the British force, after the battle of Saratoga, he returned on his parole to England, and was soon after appointed first lieutenant of the Apollo frigate, under captain Pownoll. In the midst of an action, fought in the spring of 1780, the captain fell wounded in Lieutenant Pellew's arms, who thereupon assumed the command of the ship, and soon compelled the enemy to take safety in flight. For his conduct on this occasion, he was promoted to the command of the Hazard sloop of war, from which, in March 1782, he was removed to the Pelican. A few months after he was raised by admiral Keppel to the rank of post captain, for a very spirited attack, near the Bass Rock in the Frith of Forth, on three of the enemy's privateers, all of which he drove on shore. The following ten years he spent partly afloat at various stations, and in the command of different ships, and partly at home.

On the breaking out of the war of 1793, he was appointed to the command of the frigate La Nymphe, of thirty-six guns, in which he sailed from Falmouth on the 17th June, and the next day captured the French ship La Cléopatre, after a sharp struggle. For this achievement he received the honour of knighthood. It was followed by many other successful exploits, the enumeration of which we must omit. Twice, when captain of the Winchelsea frigate, his heroic spirit was signally displayed by his leaping from the deck, and thus saving two of his drowning sailors. A more conspicuous example of this noble feeling was shown on the 26th January, 1796, when, by his great personal exertions, he preserved the crew and passengers of the Dutton transport, which, crowded with troops and their families, proceeding on the expedition to the West Indies, was driven on the rocks under the citadel at Plymouth. His own modest account of this act of benevolence, contained in a private letter which he wrote many years afterwards (1811), when commander-in-chief in the North Seas, is as follows. "Why do you ask me to relate the wreck of the Dutton? Susan (Lady Exmouth) and I were driving to a dinner party at Plymouth, when we saw crowds running to the Hoe, and learning it was a wreck, I left the carriage to take her on, and joined the crowd. I saw the loss of the whole five or six hundred was inevitable without somebody to direct them, for the last officer was pulled on shore as I reached the surf. I urged their return, which was refused; upon which I made the rope fast to myself, and was hauled through the surf on board, established order, and did not leave her until every soul was saved but the boatswain, who would not go before me. I got safe, and so did he, and the ship went all to pieces; but I was laid in bed for a week by getting under the mainmast (which had fallen towards the shore); and my back was cured by lord Spencer's having conveyed to me by letter his Majesty's intention to dub me baronet. No more have I to say, except that I felt more pleasure in giving to a mother's arms a dear little infant only three weeks old, than I ever felt in my life; and both were saved. The struggle she had to entrust me with the bantling was a scene I cannot describe, nor need you, and consequently you will never let this be visible." This letter was communicated to no one, till after the death of the writer. From this time, till the peace in 1802, Sir Edward was employed in active service, and shared largely in the success which attended the naval arms of his country. On coming home after the peace he was returned to parliament as member for Barnstaple. The resumption of hostilities, however, soon called him again abroad. In 1804 he was sent to take the chief command on the East-India station, in the Culloden of seventy-four guns; and here he remained till 1809, when he had attained the rank of vice-admiral. A few months after his return to England, he was again sent out as commander-in-chief of the fleet then blockading the Scheldt, and assisted in various operations of importance till the peace of 1814. Among the promotions which were made on that occasion, Admiral Pellew was elevated to the peerage by the title of baron Exmouth, with a pension of £2000 per annum. He also received the riband of the Bath, and a year after, the grand cross of that order. On the escape of Napoleon his services were again employed, and he was sent out in command of a squadron to the Mediterranean. From this station, in the beginning of the year 1816, he proceeded, by order of the government, to Algiers, and obtained from the Dey a promise to liberate all the subjects of the allies who were detained by him in slavery. Most of our readers will recollect the manner in which this engagement was disregarded by the African sovereign as soon as the British ships had left his coast, and the brilliant success which attended the expedition that was immediately sent out under lord Exmouth's command to compel him to perform his stipulations. Twelve hundred Christian slaves were by this exploit restored to liberty. The dignity of Viscount was the well-merited reward which lord Exmouth received for the important service which he had rendered to his country and to Christendom. The following year the chief command at Plymouth was conferred on him for the usual period of three years; and at the conclusion of that term, having now attained the age of sixty-three, he retired into private life, passing the greater part of his time at his beautiful residence at Teignmouth, where he died on the 23d January, 1833.

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FALKLAND ISLANDS, (*a.*) The Falkland islands lie between the parallels of 51° 10′ and 52° 30′ south, and the meridian 58° and 62° west near the straits of Magellan. They consist of two large and a number of small islands. The two large islands are about seventy leagues in circumference, and are divided by a channel twelve leagues in length and from one to three in breadth. The small islands are fortunately situated, so as to protect the harbours of the large ones. These islands were first discovered by Sir Richard Hawkins in 1594, or, as some say, by Captain Davis, an English navigator, in 1592; but little was known of them until Commodore Byron formally took possession of them for his majesty George III., in January, 1765, under the name of the Falkland islands. They were found to abound in ducks, teal, and all kinds of sea-fowl, and to afford plenty of fresh water. A small English settlement formed here in 1766, was destroyed in 1770 by a Spanish expedition. Spain, however, finally conceded our right to the islands. Latterly, the Buenos Ayrean government set up a claim to them, as the Spaniards had formerly used them as a prison for South American delinquents. In December, 1832, commander Onslow visited Port Egmont, on West Falkland island, and not finding any inhabitants, left an inscription, attached to a flag-staff, stating, "that these islands had been visited by his Britannic Majesty's ship Clio, for the purpose of exercising the rights of sovereignty, 23d Dec. 1832." At Port Louis, on East Falkland island, there was an inconsiderable settlement of Buenos Ayreans, chiefly engaged in catching wild cattle, &c. for the supply of such ships as occasionally touched there. Within the last few years, numerous whalers, British, American, and French, have found the Falkland isles a convenient station for refitting and taking in supplies.

FAULT; a term used by miners and geologists, to express the sudden interruption of a vein or strata, and this may be caused by a fissure of the mass of strata, and a consequent elevation of one side, and depression of the other, or it may be by the intervention of a mass of igneous rock called a dyke, which may vary in thickness from a few inches or a few feet, to many hundred yards. Dykes of trap rocks are those most commonly found traversing the sedimentary strata, and to their intrusion is owing the dislocations, and irregularities of the coal seams, a source of such frequent annoyance to miners.

FAVERSHAM; a seaport-town in the county of Kent, situated opposite the south corner of the isle of Shepey, nine miles west from Canterbury, and forty-seven east from London. It is a place of great antiquity, and consists of four principal streets forming an irregular cross. It carries on a considerable trade in corn, hops, fruits, wool, &c. with the London market. The principal manufacture is that of gunpowder, for which the town has been famous since the time of Elizabeth, and from which it has suffered several times by explosions. There is a large oyster-fishery here. Population in 1841, 4621.

FERMOY; a town in the county of Cork, Ireland, situated on the river Blackwater, seventeen miles N. by E. from Cork, and 108 S.W. from Dublin. The town is regularly built, and consists of several broad and handsome streets. It was planned and erected by the late John Anderson, Esq., whose name is associated with the first introduction of mail-coaches into Ireland. He converted a mean village, which it was at the close of the last century, into a large, handsome, and convenient town, and he lived to see it attain a character as a place of manufacture and of trade, and become the chief military station in the south of the kingdom. The public buildings are erected from regular and architectural designs. The church, designed by Mr Hargrave, is much admired. Here are also a Roman Catholic chapel, meeting-houses of dissenters, a spacious market-house, and extensive barracks for cavalry, infantry, and artillery. The barracks, erected in 1806 and 1809, are calculated to accommodate about 3000 men. Flour-mills, a paper mill, breweries of beer and ale, manufactories of soap and candles, and of various other necessaries, are established here. Population of town in 1841, 6379; of parish, including town, 7513.

FEROE ISLANDS; a group of islands in the North sea, lying between the latitudes of 61° 15′ and 62° 21′, at almost equal distances from Iceland, Orkney, and Norway. They are in number twenty-two, seventeen of which are inhabited, and they extend altogether sixty-seven miles in length from north to south, and forty-five in breadth from east to west. They consist of steep rocks, the bases of which are separated by narrow and shallow channels of the sea, and whose sides, for the most part, form precipices, from two to three hundred fathoms high. Within these iron-bound coasts there are no valleys of any extent; but a few narrow dales, broken and craggy, are found between their summits, where the energies of man are hardly taxed to win a scanty supply from the soil, which never exceeds four feet, and is frequently not more than eight inches in depth. This soil, moreover, is often swept away by the winds of the north, that in a moment can destroy the labour and improvement of years. These winds descend from the lofty hills to the shore, impelling large stones, and rolling them forward like balls; at times even tearing the turf from the sides of the hills, rolling it together like a sheet of lead, and precipitating it into the valleys. To hinder the roofs of their houses from being blown away, the poor Feroese are obliged to place boards upon them, and to throw ropes over them, the ends of which are fastened to heavy stones. Another dreadful enemy they have to contend with, is the voracious rat. These animals are so numerous, that they will sometimes destroy half a corn-field in a single night, and when they get at the sea-fowl in the crannies of the rocks, they commit such havoc that the bold fowler, who pursues his avocation at the risk of his neck, finds little left to reward his pains and perils. In one island, the church-path, which is the best and often the only road, is so steep and narrow that at funerals the corpse is fastened to a board and carried upon men's shoulders. At another island, when the clergyman comes to visit them, which he does on Sundays as often as the weather and the sea will allow, they hoist him up the lofty steep cliffs, from his boat, by a rope, there being no other possible means of landing. Yet in spite of these manifold difficulties and horrors,(according to Landt, a Danish pastor who resided among them many years and who wrote an admirable account of these islands,) the Feroese are a virtuous, a civilized, and a happy people. Though obliged to struggle hard for their subsistence, which is mainly procured by the perilous occupations of fishing in their dark and stormy northern seas, and fowling among their giddy precipices, they all find time to acquire reading, writing, and arithmetic. They are of an extremely peaceable disposition; hospitable according to their means; kind and benevolent. They are strictly honest in their dealings with each other, and humane and compassionate towards strangers.

The population of these islands amounted, according to a census taken in 1812, to 5209. The whole of the king's revenue amounted, in the year 1790, to 3172 rix-dollars. Sheep form the principal riches of the islands, and the number possessed by them in 1812 was estimated at upwards of 35,000. Some individuals have flocks of 200 and 300. These sheep are allowed to run about both in summer and winter without ever being housed. The wool is in general coarse, and is torn off the hide in a very rough manner. On the more basaltic islands, the grass is uncommonly fattening and luxuriant. The Danish government generally assigns the monopoly of the trade of these islands to some private mercantile company at Copenhagen, under the condition of supplying the islanders with a sufficient quantity of grain at a certain fixed price. The exports consist of hose knit on the islands, to the annual amount of 100,000 pairs; tallow, fish, train-oil, feathers, skins, and butter.

Stromoe is the largest of the Feroe islands, being twenty-seven miles long and seven broad, extending S.E. and N.W. About a dozen villages are interspersed through it. Thorshaun is the capital, and is situated on a small tongue of land on the south-east of the island. It is the seat of government, as well as the staple of trade; and the residence of the principal civil officers, such as the commandant, chief-justice, &c. There is here a Latin school (being the only seminary, indeed, in all the islands), and a neat church covered with slate. The town is defended by a fort constructed on a projecting rock, which was strengthened and repaired during the American war. The houses of the town are almost all built of wood, and the streets in general so narrow, that only one person can conveniently walk through them. The town contains only between 500 and 600 inhabitants. There was here formerly a mart for Danish East and West Indian goods, and a considerable trade carried on with Scotland; but this has almost entirely ceased since the termination of the American war.

The Feroe islands, it is believed, were first peopled by some Norwegians in the ninth century, who retired thither from the sway of the renowned Harold Harfazer, king of Norway, and supported themselves, after the manner of their fathers, by piracy. It is evident, however, from their language, which is a corrupted mixture of old Danish, Finnish, and other northern dialects, that, subsequently, these were joined by emigrants from Finland, and other parts of Scandinavia. Magnus the Good, Harold's successor, afterwards reduced these islands to obedience, and they continued to belong to Norway until, upon the union of the crowns, they were annexed to Denmark. During the last war, some British privateers landed and plundered various of these islands; but the British government, on learning the circumstance, issued an order of counsel, declaring that the inoffensive islanders were not to be molested in consequence of the war between Great Britain and Denmark.

FEATHERS, (*a.*) If we had never seen the covering of birds, we could have formed no conception of anything so perfect and beautiful; and which, by uniting in the highest degree the qualities of warmth, lightness, and least resistance to the air, forms a vestment so appropriate to the life which the animal is to lead. While we observe the general aspect of the feathered world, we must admire the wisdom and goodness of the Deity in this part of his creation; and our admiration will be increased by further examination. Every feather is a mechanical wonder. If we look at a quill, we find two properties not easily brought together, strength and lightness. There are few things more remarkable than the strength and lightness of the pens with which we write. If we look at the upper part of the stem, we see a material made for the purpose, used in no other class of animals, and in no other part of birds, tough, light, pliant, and elastic. The pith, also, which feeds the feathers, is unlike any other animal substance; it is neither bone, flesh, membrane, nor tendon. But the artificial part of a feather is the beard, or, as it is sometimes called, the vane. The beards are fastened on each side of the stem, and constitute the breadth of the feather, and we usually strip them off, from one side or both, when we make a pen.

The separate pieces, or laminæ, of which the beard is composed, are called threads, sometimes filaments, or rays. The first thing to be observed is, how much stronger the beard of the feather shows itself to be, when pressed in a direction perpendicular to its plane, than when rubbed either up or down in the line of the stem; and the structure which occasions this difference is, that the laminæ, of which these beards are composed, are flat, and placed with their flat sides towards each other, by which means, while they easily bend for the approaching of each other, as you may perceive by drawing your finger ever so lightly upwards, they are much harder to bend out of their plane, as that is the direction in which they have to encounter the impulse and pressure of the air, and in which their strength is wanted, and put to the trial.

This is one peculiarity in the structure of a feather, and a second is still more remarkable. If you examine a feather, you cannot help taking notice, that the threads, or laminæ, of which we have been speaking, in their natural state unite; that their union is something more than the mere opposition of loose surfaces; that they are not parted asunder without some degree of force; that nevertheless, there is no glutinous cohesion between them; that therefore, by some mechanical means or other, they catch, or clasp among themselves, thereby giving to the beard, or vane, its closeness and compactness of texture. Nor is this all: when two laminæ, which have been separated by accident or force, are brought together again, they immediately reclasp; the connection, whatever it was, is perfectly recovered, and the beard of the feather becomes as smooth and firm as if nothing had happened to it. Draw your finger down the feather, which is against the grain, and you break, probably, the junction of some of the contiguous threads; draw your finger up the feather, and you will restore all things to their former state.

The threads, or laminæ, are interlaced with one another, and the interlacing is performed by means of a vast number of fibres or teeth, which the laminæ shoot forth on each side, and which hook and grapple together. A person counted fifty of these fibres, in one-twentieth of an inch. These fibres are crooked but curved, after a different manner; for those which proceed from the thread on the side towards the extremity of the feather, are longer and more flexible, and bent downward there, as those which proceed from the side towards the beginning, or quill-end of the feather, are shorter, firmer, and turn upwards. When two laminæ are pressed together, so that these long fibres are forced far enough over the short ones, their crooked parts fall into the cavity made by the crooked parts of the others; just as the latch that is fastened to a door, enters into the cavity of the catch fixed to the door-post, and there hooking itself, fastens the door; for it is in this manner that one thread of a feather is fastened to the other.

This admirable structure of the feather, which it is easy to see with the microscope, succeeds perfectly for the use to which Nature has designed it; which use was, not only that the laminæ might be united, but that when one thread or lamina has been separated from another by some external violence, it might be reclasped with sufficient facility and expedition

In the ostrich, this apparatus of crotchets and fibres, of hooks and teeth, is wanting: and the consequence is, that the filaments hang loose and separate from one another, forming only a kind of down. This constitution of the feathers, however it may fit them to adorn a lady's head-dress, may be considered an imperfection in the bird; as wings composed of these feathers, although they may greatly assist it in running, do not serve for flight.

FILTRATION OF WATER, (*a.*) So little has been written on the subject of filtration of a practical nature, that the art of conducting the process upon a large scale is yet to be acquired. Several trials have been made on superficies exceeding one thousand square feet, to ascertain the most approved principle, and the fitness of the various materials proposed to be employed. All the modifications of lateral and ascending filters have proved disadvantageous; difficulties have been encountered in preserving the various strata in their assigned position, according to the sizes of their component particles; and effectual cleansing could not be accomplished without the removal of the whole mass of the filtering medium. All devices by currents, reaction of water, and other means, have also proved either inefficient, or inconvenient and expensive.

The mode of filtration adopted at the Chelsea works is by descent, and the medium consists of fine and coarse river-sand, comminuted shells, and pebbles, and of small and large gravel. These materials are laid in a reservoir, their surface being disposed in ridges, which presents to the spectator an undulated appearance. The first experiments by descent failed; sufficient care had not been taken in the selection and separation of the material. Explosions of condensed air in the tunnels for collecting the filtered water deranged the strata occasionally, and were obviated by air-drains. The filtration was, in one instance, stopped by the addition of fresh sand, without having previously removed the old sand, which should be applied as the upper stratum; although, in this case, the surface had been thoroughly cleansed previously, a film or puddle was formed on the original sand, and was sufficiently supported by the particles of sand to sustain five feet head of water, at first acting to impede, and eventually to stop the filtration. The process was greatly improved by the introduction of the small shells, such as are usually found at Shellness, the flat surfaces of which overlap, and assist in the great desideratum of separating the sand from the gravel, and thus tending to preserve the free percolation in the lower strata, which is essential for ensuring filtration sufficiently rapid for waterwork purposes.

The strata on the site of the filtering-works, under the vegetable mould, consist of loam, sand, and gravel, overlying the London clay to the depth of thirty feet. The sand and gravel contain powerful land-springs, and the masses of ferruginous conglomerate they pass through are so great, that the water is of an objectionable quality; therefore, in constructing the basin to receive the filtering materials, it was necessary to exclude all the land-water by clay and cement walling.

An excavation into the sand and gravel, of sufficient depth to admit of the water from the river flowing on to the filtering bed, would have involved too great an outlay; and this circumstance led to the construction of the basin, at a level which rendered pumping the water from the river unavoidable; but the consequent subsidence of the water, and the command of a constant flow to the filtering-bed, are advantages which result from the expedient of pumping; and the interest of the money saved has more than compensated for the annual expense. The filtering-bed covers an area of one acre, and there is an elevated reservoir of nearly the same size. The lower stratum of gravel contains the tunnels for collecting the filtered water. They are built with cement-blocks, and partially open jointed, two spaces of an inch and a half on the bed, and the heading-joint of each brick being open. The fine gravel, pebbles and shells, and the coarse and fine sand, are laid upon the large gravel.

The water is let on to the filtering bed at nine places, and the ends of the pipes are fitted with curved boards to diffuse the currents of water, and prevent the surface of the sand from being disturbed. The interstices in the fine sand being more minute than the subjacent strata, it is found that the impurities are arrested near the surface, and it has not been necessary to remove more than one inch depth of the sand at any one time of cleansing. This work is effected by scraping the surface every fortnight, and upon a careful examination it has been discovered that the sediment penetrates to the depth of from six to nine inches, according to the state of the Thames water; the greatest penetration occurring during the prevalence of land floods in the river. Notwithstanding this, however, it is not necessary to remove more than the depth stated, which contains the grosser impurities, the remainder tending rather to improve filtration by rendering the interstices between the particles of sand still more minute. From these observations it must not be inferred that the process is merely a fine mode of straining, for something more is evidently effected; an appearance resembling fermentation being discernible when the water is in contact with the sand.

The quantity of water filtered is from three to four hundred thousand cubic feet daily, according to the demand. The undulated surface of the filtering-bed admits of parts of it being worked, and others drained; and it aids in cleansing, by admitting the grosser particles of the silt to slide down the ridges, and form a sediment easily manageable. The removal of the sand is effected by lifting portions of the fine sand in succession, and placing fresh sand of the same description underneath them.

FITZWILLIAM, Earl. The Right Hon. William Wentworth Fitzwilliam, fourth earl Fitzwilliam, of the county of Tyrone, was born May 30th, 1748, the elder son of John the second Earl, by lady Anne Wentworth, eldest daughter of Thomas first marquis of Rockingham. He was only in the ninth year of his age at the death of his father, August 10th, 1756, when his large estates were confided to the care of Sir Matthew Lamb, grandfather of the present viscount Melbourne. At an early age he was sent to Eton, where he had for class-fellows Charles Fox and the late Earl of Carlisle; with both of whom he formed that close intercourse, which, with little interruption, lasted through life. From Eton his lordship removed to King's college, Cambridge; and he afterwards travelled abroad. The degree of D.C.L. was conferred upon him at Oxford, July 3d, 1793. In 1769, he took his seat in the house of peers. Few young noblemen ever entered life under more favourable auspices. Inheriting a good fortune from his father, he was also the presumptive heir to the large estates of the marquis of Rockingham; and was honoured with the friendship of the dukes of Devonshire and Portland, and all the leading characters of the Whig party. These connections he still further extended, by an early marriage, on the 11th of July, 1770, with lady Charlotte Ponsonby, youngest daughter of William Earl of Besborough. Enrolling himself among the opponents of lord North's administration, he persevered, throughout the American war, in resisting the progress of that contest, as equally disgraceful and ruinous. When the change of ministry, however, took place at the beginning of 1782, and his uncle the marquis of Rockingham was placed at the head of the new cabinet, Earl Fitzwilliam did not take part in the distribution of office. The death of the marquis, which happened in June of the same year, brought Earl Fitzwilliam a vast accession of fortune, including the fine domain of Wentworth, near Rotherham, in Yorkshire, which had descended to the family of Watson from the sister and heiress of the great Earl of Strafford. After succeeding to Wentworth, the Earl made that noble mansion, which had been built by his maternal grandfather, his most usual summer residence, and in 1807, prefixed the name of Wentworth to the surname of his ancient house. On the 11th of July, 1794, when the duke of Portland became the nominal head of the cabinet, while Mr Pitt guided the helm, earl Fitzwilliam accepted the office of president of the council, which he held until the 17th of December following. He was afterwards appointed lord lieutenant of Ireland. His inclination to healing measures rendered this appointment peculiarly acceptable to the people of that kingdom, and he was received with universal satisfaction. The Irish parliament met on the 22d of January, 1795, and unanimously voted him the most favourable addresses; and, on the 9th of February, agreed to the amplest supplies that had ever been granted in that kingdom. In order to place himself in a favourable light with the Catholic party, he employed, in the transactions with its leading members, a person in whom the Catholics universally confided: this was the celebrated Mr Grattan, whom they had selected as the most proper and active member of the Irish legislature for the effecting of their purposes. Mr Grattan moved, accordingly, on the 12th of February, for leave to bring in a bill for the relief of persons professing the Roman Catholic religion; and leave was given. The joy and exultation expressed by the Roman Catholics on this occasion, had never been equalled in Ireland. But the universal satisfaction arising from the hopes conceived of an approaching emancipation from all restrictions was quickly damped by the intelligence that arrived two days only after the passing of the motion, that the British ministry were averse to the measure. Earl Fitzwilliam informed them of the great danger that would infallibly result from retracting the assent so formally given to a motion of such importance; and explicitly refused, by taking upon him that office, to be the person to raise a flame which nothing but the force of arms could keep down. Such were his own words. In consequence of this answer, he was dismissed from his post, which was conferred upon earl Camden. The resentment of the people of Ireland was particularly marked on the 25th of March, when earl Fitzwilliam took his departure. It was a day of general gloom: the shops were shut, no business of any kind was transacted, and the whole city put on mourning. The noble earl's coach was drawn to the waterside by some of the most respectable citizens; and the people seemed intent on every demonstration of grief. When the death of Mr Pitt occasioned a new ministerial change, in 1806, earl Fitzwilliam returned to the seat of president of the counsel, which he retained until the fall of the Grenville administration in the following year. He afterwards gradually retired from public life: and, in 1819, he resigned the lieutenancy of the west riding of Yorkshire, which he had held from 1798. At a visit which he paid to Ireland a few years previous to his death, he was welcomed with the utmost enthusiasm. Indeed, independently of the popular measures with which he had connected his reputation, his liberal and beneficent management of his large Irish estates fully deserved every mark of the public approbation and respect. His private charities were very extensive. His manners were engaging, persuasive, and attractive. His pleasures were chiefly those of the chase, in which, in the midst of a splendid circle, he combined the keenness of the sportsman with the magnificence of a prince. Upwards of a hundred horses belonged to his hunting establishment. The cortège with which he was accustomed to attend the races at Doncaster might be regarded as an imposing relic of ancient manners. His lordship died at Milton house, near Peterborough, on the 8th of February, 1833, in the 85th year of his age, leaving an only son, lord Milton, now earl Fitzwilliam.

FLESH-FLY. The history of the Flesh-fly (*musca carnaria*) is better known than that of the common one. It deposits its eggs on flesh, and then the latter is said to be fly-blown. It is a law of nature, that the particles which form an organized body, shall, on its dissolution, serve for the sustentation of others; and hence, when an animal dies, it is taken possession of, in one way or another, by those which are living. In hot weather a dead body runs rapidly into putrefaction, and in that state attracts, by its odour, those flies which lay their eggs in flesh, and the carcass is very soon occupied by myriads of maggots, which are hatched from those eggs, and are flies in the larva state. When we think of the horrible odour which a putrefying animal emits, we cannot but admire the wise arrangement by which its very odour is made agreeable to multitudes of living creatures; for, as Paley remarks, maggots revel in putrefaction. We observe, also, that the odour is most powerful at those times when flies are most numerous and active, that is, in hot weather. In the egg itself there is the very wise provision, that it is hatched in a few hours, and the maggot arrives at its full growth in a week; and thus we see how divine wisdom is displayed in every thing, even in what, to ordinary comprehension, is most disagreeable or disgusting. If the fly's eggs did not hatch in a very short time, and the larva soon attain its full growth, the object in view would not be gained. In some other species of flies whose larvæ feed on flesh, not a single moment is lost; for, instead of an egg being laid, the larva is deposited in the living state, the egg having been previously hatched within the body of the parent; this, indeed, is stated to occur very often with the common flesh, or blow-fly.

FLETCHER, Mrs, formerly Miss Jewsbury, a very agreeable writer, was a native of Warwickshire. Early in life she was deprived of her mother, and thenceforth called upon to take her place at the head of a large family (then removed to Manchester), with the further trial of most precarious health. At an early period of her life she ventured to address a letter to Wordsworth, which led to a correspondence, and thence to a permanent friendship. She was also materially assisted in the developement of her talents, and bringing their fruits before the public, by the advice and active kindness of Mr Alaric Watts, at that time resident in Manchester; an obligation which she was always ready gratefully to acknowledge. Her first work was entitled "Phantasmagoria; or, Essays on Life and Literature," which was well received by the public. This was followed by her "Letters to the Young," written soon after a severe illness; her "Lays for Leisure Hours," and lastly, her "Three Histories," all of which were deservedly popular. But many of her best writings are scattered among the annuals and other periodicals. Mrs Fletcher died in India, on her way from Sholapore to Bombay, 3d October, 1833.

FOLKSTONE; a seaport town of England, in Kentshire, situated on the shore of the English channel, opposite to Boulogne, seventy miles E.S.E. of London. The harbour here is extensive and convenient, capable of receiving vessels of 300 tons burden. The fish brought in here are regarded as a superior kind, and the boats employed are numerous; they are engaged during the season in catching mackerel for the London markets; and at Michaelmas, turn their attention to the herring-fishery on the Norfolk and Suffolk coasts: soles, whiting, conger-eels, and other fish, are obtained here in the highest perfection. From the salubrity of the air, and its delightful scenery, Folkstone is much frequented by company, for the pleasure of sea-bathing. Harvey, the discoverer of the circulation of the blood, was a native of Folkstone. Population of town and parish in 1841, 4413.

FORBES, Sir William, an eminent Scottish banker, was born at Edinburgh, in 1739. His father, who was bred to the Scottish bar, died when Sir William was a child, and he was removed with his mother to Aberdeen, where he received the early part of his education. In 1753, he returned to Edinburgh, and was received as an apprentice into the banking establishment of Messrs Coutts. His apprenticeship lasted seven years, during which he continued to live with his mother in a frugal manner, but in the enjoyment of the best society of Edinburgh. After its expiry, he acted for two years as clerk in the establishment, during which time his increasing emoluments enabled him to make a considerable addition to the comforts of his mother, whose happiness was ever the chief object of his care. In 1761, his excellent abilities and application to business induced the Messrs Coutts to admit him as a partner, with a small share in the banking-house, and he ever after ascribed his good fortune in life to the fortunate connection thus formed with that great mercantile family. But without being insensible to the benefits arising from such a connection, it is perhaps more just to ascribe it to his own undeviating purity and integrity of character, which enabled him to turn to the best advantage those fortunate incidents which at one time or other occur to all in life, but which so many suffer to escape from negligence, instability, or a mistaken exercise of their talents.

In 1763, one of the Messrs Coutts died, another retired from business through ill health, and the two others were settled in London. A new company was therefore formed, consisting of Sir William Forbes, Sir James Hunter Blair, and Sir Robert Herries; and although none of the Messrs Coutts retained any connection with the firm, their name was retained out of respect to the eminent gentlemen of that name who had preceded them. The business was carried on on this footing till 1773, when the name of the firm was changed to that of Forbes, Hunter, and Co., which it has ever since been; Sir Robert Herries having formed a separate establishment in St James Street, London. Of the new firm, Sir William Forbes continued to be the head from that time till the period of his death; and to his sound judgment and practical sagacity in business, much of its subsequent prosperity was owing.

In 1770, he married Miss Elizabeth Hay, eldest daughter of Dr (afterwards Sir James) Hay; a union productive of unbroken happiness to his future life.

The benevolence of Sir William Forbes's character, his unwearied charity and activity of disposition, naturally led to his taking a very prominent share in the numerous public charities of Edinburgh. In plans for the better management of the charity Work-House, the Orphan Hospital, and the erection of the High School, he was actively engaged. He was also an active promoter of the society of Scottish Antiquaries, the institution of trustees for the encouragement of manufactures and Fisheries, and the establishment of the present Lunatic Asylum. He was also one of the most zealous of those who promoted and carried to a happy conclusion the erection of the South Bridge; one of the most useful and successful of the improvements of Edinburgh. Sir William was a warm adherent of the Scottish Episcopal church, to promote the benefit of which he was unwearied in his exertions. Chiefly by his own efforts, and those of his son, the late Sir William, the Episcopal communion of Edinburgh was raised from the most obscure situations in the old town, and placed in two beautiful edifices, raised at an expense of above £30,000. Taking the principal lead in connection with this communion, he was mainly instrumental in bringing to Edinburgh the late Rev. Mr Allison, the well-known author of the Essay on Taste, from a remote rectory in Shropshire.

Sir William's success in trade enabled him, about the year 1781, to acquire the estate of Pitsligo, in Aberdeenshire, by purchase, and thus he realized an early and favourite wish of restoring to his ancient family their paternal inheritance. A new field was now opened for his active benevolence of disposition. He commenced improvements on a liberal scale; laid out the village of New Pitsligo, and gave every assistance to the feuars. Numbers of poor cottars were established by his care on the most uncultivated parts of the estate, most of whom not only paid no rent for the land they occupied, but were pensioners on his bounty.

In 1768, he spent nearly a twelvemonth in London, in Sir Robert, then Mr Herries's family; and such was the opinion formed of his abilities even at that early period, that Sir Robert anxiously wished him to settle in the metropolis in business; but though strongly tempted to embrace this offer, from the opening which it would afford to London society, of which he was extremely fond, he had sufficient good sense to withstand the temptation, and prefer the more limited sphere of his own country as the scene of his future usefulness. But his residence in London at that time had a very important effect upon his future life, by introducing him to the brilliant, literary, and accomplished society of that capital,—Dr Johnson, Mr Burke, Sir Joshua Reynolds, Mr Gibbon, Mr Arbuthnot, and a great many others. He repeatedly visited London for months together at different times during the remainder of his life, and was nearly as well known in its best circles as he was in that of his own country. At a very early period of his life he had conceived the highest relish for the conversation of literary men, and he never afterwards omitted an occasion of cultivating those whom chance threw in his way; the result of which was that he gradually formed an acquaintance, and kept up a correspondence, with all the first literary and philosophical characters of his day. His taste in this respect probably suggested to him the idea of writing the life of Dr Beattie, the author of the Minstrel, and one of his earliest and most valuable friends. He executed this work accordingly, which appeared in 1805, shortly before his death, and in such a way as to give the most favourable impression of the distinction which he would have attained as an author, had his path in general not lain in a more extended and peculiar sphere of usefulness.

Besides his other qualities, Sir William was a good draughtsman; was well acquainted with music, and by his efforts contributed much to form the concerts which in his day formed so prominent a feature of the Edinburgh society. His conversational powers were considerable, and his store of anecdotes very extensive. He likewise supported to the utmost of his power, every project for the amusement and gratification of the young, in whose society he always took great pleasure. He was not less remarkable for his unambitious views. He was frequently offered a seat in parliament, both for the city of Edinburgh and the county of Aberdeen; but he uniformly declined the offer. In 1799, he was offered an elevation to the peerage, by which the family title of Pitsligo might have been restored; but this honour he likewise respectfully declined.

In 1802, Sir William had the misfortune to lose lady Forbes. In May 1806, he began to feel symptoms of shortness of breath, and his sufferings for many months were very severe. He died on the 12th of November, 1806. He was succeeded in his title and estates by his son, the late Sir William, a man of the most amiable and upright character, who having been cut off in the middle of his years and usefulness, was succeeded by his son, the present Sir John. The subject of the present sketch left a large family. Besides lord Medwyn (a senator of the college of justice), and Mr George Forbes, who have succeeded to the unwearied activity and benevolence of their father's character, he left five daughters.

FORE, FOURE, or FOWRE, is an ancient corporate town in the parish of the same name, and the barony of Demifore, in the county of Westmeath, Leinster. It is a place of very trifling importance at the present day, though it sent two members to the Irish House of Commons up to the period of the union. It is situated upon the north side of the hill or rising ground which interposes between it and Lough Lene.

At the foot of the town are the ruins of an ancient monastery. This was a priory of canons regular, built by St Fechin, about the year 630; the founder died of the plague in 665, after having, as is said, ruled over three thousand monks in this abbey. The annals of the abbey make us acquainted with some particulars concerning the town. The records of the years 827, 870, 970, 1025, 1086, 1095, 1112, 1114, 1149, and 1169, are but a series of plunderings and burnings. In 1025, the "Ferman Fechin, or glebe lands of Fore, were plundered and burnt by the tribe of Criochan, on the eve of the nativity." In 1209, Walter de Lacie refounded this abbey, under the invocation of St Taurin and St Fechin, for monks of the order of St Benedict, whom he brought for that purpose from the abbey of St Taurin, in Normandy; he made it a cell to that Norman abbey, since which period it has generally been called the priory of St Fechin and St Taurin. We learn, also, from these annals, that in the year 1436, on the 26th of May, king Edward III. laid a tax by letters patent, to continue for twenty years, on all things brought to market in this town, or within three miles of the same, or in the towns of Molingar and Multifernam, and within three miles of the same, also on all goods going out of the said towns,—for the purpose of raising a sum of money sufficient to defray the expence of paving the town, and to build a ditch or stone wall for the better security of his Majesty's English subjects against their Irish enemies, who had thrice burnt the said town to the ground.

FORMATION; geological strata are divided into certain groups of one era of deposition, and frequently of the same or nearly similar mineralogical character, which have been denominated formations—such as the carboniferous, volitic, cretaceous, tertiary, silurian, &c. which see.

The following is the arrangement and succession of the various formations:

SEDIMENTARY STRATA.

Gneiss		Stratified primary series, containing no traces of organic remains.
Mica slate		
Clay slate		
Chlorite slate		
Quartz rock		
Primary marble		
Grey wacke	Silurian system of Murchison.	
Transition limestones		
Old red sandstone		
Mountain or Carboniferous limestone	Coal measures	Secondary series stratified, containing remains of plants and animals, for the most part extinct species.
Carboniferous sandstone		
Magnesian limestone	Salt Gypsum.	
New red sandstone		
Lias		
Oolite		
Green sand		
Chalk		
London clay		Tertiary series, or supracretaceous strata, containing the remains of marine animals, quadrupeds, birds, reptiles.
Paris Basin, &c.		
Diluvium		
Alluvium		

IGNEOUS OR PLUTONIC ROCKS.

Granite, Syenite Porphyry Greenstone—Basalt Lava	Unstratified, of different ages, more or less crystalline, destitute of organic remains.

FORFAR; a royal burgh of Scotland, capital of Forfarshire, is situated fourteen miles north from Dundee, and fifty-six from Edinburgh. It is a place of unknown antiquity, its privileges having been confirmed by a royal writ in 1669. The town has been, within the last few years, ornamented with a handsome suit of county buildings, situated in Castle street. A new church and steeple have likewise been built, as also a new episcopal chapel, in High street, finished in 1823. Being the seat of the county courts of the sheriff, the town has a number of public offices and legal practitioners. The town has now an excellent subscription news-room and library. Besides the established church and episcopal chapel, there is a meeting-house of the united secession body and methodists. The inhabitants are chiefly employed in the manufacture of canvass, sheeting, and other coarse linen, also in making the shoes called brogues. The parish is of an irregular figure, from four to six miles long, by three to five broad, and the surface, except the hill of Balnashinar, mostly level and fertile, the soil having been much enriched by the manure from Loch Restenet, which has been lately drained, and on the banks of which are the ruins of a priory, formerly subject to that of Jedburgh. The ancient castle of Forfar is totally demolished. Population of burgh and parish in 1841, 9620.

FORFARSHIRE, OR ANGUS; a county on the east coast of Scotland, bounded on the east by the north sea and Kincardineshire; on the west by the Grampian hills and Perthshire; on the north by the North Esk river and shire of Aberdeen; and on the south by the Firth of Tay. Its extreme length from east to west is thirty-eight and a half miles, and its greatest breadth from north to south thirty-seven and a half miles. It is said to contain eight hundred and thirty-one and a half square miles, or about 532,160 imperial acres. The great level valley of Strathmore runs through the centre of Forfarshire from east to west, and the lines of hills which flank this extensive and beautiful tract of country, with the Grampians on the north, and some minor ranges on the south, may be said to form the county into a series of continuous ridges, generally pursuing a direction from west to east, interrupted here and there by the different rivers and streams seeking their way to the sea, and which, notwithstanding the courses of the hills, in most instances follow a south-easterly direction. The portion of the Grampian mountains in this shire contains many fine valleys, and from the summit of these elevations to the ocean on the east and the Tay on the south, the surface of the land may be considered an inclined plane facing the meridian sun, with the exception of the territory on the northern side of the Sidlaw hills. In viewing the county from the Fife side of the Tay, the Sidlaw range appears to rise at no great distance from the estuary, and extending from the east towards Perth, shuts out a prospect of the interior. The highest of these Sidlaws is not much more than 1700 feet above the level of the sea. From the summit of the highest Grampian hill, a fine prospect can be obtained not only of almost the whole country adjoining the Tay and of the ocean, but of the eastern part of the peninsula of Fife, the coast of East Lothian, and the heights of Lammermoor. With the contiguous county of Kincardine on the north, Forfarshire anciently formed the country of the *Horesti*, and a portion of the Pictish kingdom. On the dissolution of that government by Kenneth II., about the end of the ninth century, he is said to have divided it between his two brothers, Angus and Mearns, from whom the two counties still derive their popular appellation. The district gave the title of Earl to two different families. On the extinction of the first, the earldom was conferred on a relation of king David Bruce, and in 1477, it merged in the family of the Douglasses. It has since devolved on the duke of Hamilton. In ecclesiastical matters, Angus and Mearns form a synod of the established church, comprehending six presbyteries.

Forfarshire is now a highly cultivated county, having advanced as far as any in Scotland in agricultural improvement. Its chief rivers are the North and South Esk, which rise near each other, on the northern confines of the county and the Tay. The salmon fisheries on these are very valuable, great quantities of fresh salmon, packed in boxes of ice, being sent from them to the London market. The county is also watered by numerous fine trout streams. It abounds in freestone and limestone, but is destitute of coal, being dependent on the Fife and Newcastle collieries for that essential article of fuel. In the Grampian district peat is chiefly used. The spinning of flax, and the manufacture of linen, sail-cloth, osnaburghs, &c., form the chief trade of the county. Forfarshire comprises nearly fifty-three complete parishes, in which are the five royal burghs of Dundee, Arbroath, Montrose, Brechin and Forfar, and the towns of Glammis and Kirriemuir. A large proportion of the inhabitants, especially of the wealthier class, are attached to the episcopal church, and their adherence to the principles of this communion is particularly noticeable in the number of episcopal chapels all over the district. There are a number of old ruinous castles in Forfarshire, most of which have gone into decay, in consequence of the baronies on which they stand having passed into the hands of proprietors of other estates. Population in 1821, 113,430; in 1841, 154,141.

FOTHERINGAY; a village in the north-eastern part of Northamptonshire, near Oundle, noted as the place where Mary queen of Scots was beheaded. The castle, now in ruins, was the scene of many historical events. This structure was originally founded by Simon St Liz, second earl of Northampton, in the time of William the Conqueror. It was rebuilt by Edmund, duke of York, son of Edward III.; the keep was built in the form of a fetterlock, which, with the addition of a falcon in the centre, was the emblem of the family of York. The same figure, in stained glass, was emblazoned in most of the castle-windows. By marriage, it became the property of the Scottish kings; but in the reign of John, David, king of Scotland, was summoned to surrender the castle to the crown of England; and refusing to comply, the sheriff was directed, by royal mandate, to force him to submission. In this castle Richard III. was born; and Mary, queen of Scots, after having suffered a long imprisonment, was tried and condemned in the hall, in the year 1586, and shortly afterwards executed.

In the reign of James I., a few years after the execution of his mother, the condition of the castle ascertained by proper inquisition, was as follows:—

The castle was built of stone, and surrounded a fair court, being itself encompassed by a double moat. The great dining-room was well garnished with pictures, the hall large and spacious, the lodgings were goodly; there was a convenient yard for wood, large brewhouses, and a capacious barn. On the south side the river Nene formed the moat, and the inner moat was formed by the mill-brook. The demolition of the castle by James was intended to mark his indignation at the execution of his mother. In 1787, when Mr Nicholls visited the site, he remarked that "almost all the materials have been carried away, and even the foundations dug up, for the purposes of building, and for repairing the roads, causeways, and banks of the river. The palace was situated on the south-east side of the castle-hill, fronting the river that runs below, commanding a most beautiful prospect over the extensive meadows into the south. The porch, or entrance, except a small fragment, has been taken down within these few years. A farm-house has been built on the spot occupied by the old stables." Mr Nicholls says that the hall where Mary was beheaded was on the first ascent, and the keep on the second. There was an excellent specimen of an old hostelry existing in 1787, which was then still used as an inn.

The village has not a population of three hundred souls. The fair and market which it once possessed have long ceased to attract sellers and buyers. A nunnery which existed here was transferred at an early period to another place. In 1411 a college was begun for a master, twelve chaplains, or fellows, eight clerks, and thirteen choristers. Henry IV., and Edward, duke of York, who was buried at Fotheringay, were the co-founders of this institution, which was not dissolved until the reign of Edward VI. As Leland remarks of the village—"The glorie of it standeth by the paroch church of a fair buildid and collegiated." It contains an ancient stone pulpit and a fine font.

FURNESS ABBEY, at one time an extensive and important monastic establishment, which now forms a series of splendid ruins. It is situated in Lancashire, in the parish of Dallon in Furness, and hundred of Lonsdale, distant from Ulverstone seven and a half miles. The abbey was founded by king Stephen, and was of the Cistercian order. It rose high in rank and power, and its ruins are to this day among the most splendid monuments of architectural antiquity in the county. Professor Wilson has celebrated it in a poem of considerable extent, entitled, "An Evening in Furness Abbey."

FUR-TRADE. (*a.*) The fur-trade of North America has long been an extensive and lucrative one. So early as 1670, a company was established, termed the Hudson's Bay Company, which exists under the same name to the present day, and has always possessed a large share of the traffic. Numerous other companies have sprung up from time to time with the same views; of which the North-west, the North American, and the Columbian companies, have been the most important and successful. In all these establishments, the natives are the principal collectors of the furs, which they barter for arms, and such other commodities as civilized nations can alone manufacture. Only two companies, properly speaking, now exist; the Hudson's Bay Company having been of late years incorporated with the North-west one. The shareholders of this establishment are almost all of them British merchants, resident in London. With respect to the other companies, the North American was composed of a body of New York merchants, and the Columbian likewise was supported by the inhabitants of the United States. The latter of these companies confined its operations to the Mississippi and St Peter's river, while the American company held possession of the trade on the Upper Mississippi, Missouri, and the great lakes. After existing separately for many years, these establishments were united, and still continue so. The Hudson's Bay Company, again, as its name implies, trades in the more northern regions of the new world, occupying, with its numerous branches and stations, the whole range of country between the lakes and the arctic sea. Private adventurers, and smaller firms, are to be found, besides, engaged in many quarters in the fur trade, but it can only be carried on efficiently by an enlarged combination both of men and capital. It is from this cause, rather than from privileges and charters, that the large companies have always enjoyed a monopoly, which smaller associations, rising now and then, could never disturb.

The most noted of the numerous establishments of the Hudson's Bay Company are Churchill Fort, York Factory, and Moose Fort, on Hudson's Bay; Fort William on Lake Superior; Norway House on Lake Winipeg; various forts and houses on the rivers which descend from the Rocky Mountains, such as Carlton House on the north branch of the Saskatchewan, Chesterfield House on the south branch, and Cumberland House on the united or main stream of the same river, which falls into Lake Winipeg; Fort Chipewyan on the Athabasca Lake, from whence Mackenzie set out on his two expeditions; Fort Resolution on Great Slave Lake; and Forts Simpson, Norman, and Good Hope, on the Mackenzie River; the latter is the most northerly establishment, and is about 3800 miles from Montreal. The furs, however, which are procured at the most northern establishments are shipped from Hudson's Bay. All the routes taken by the fur-traders are chains of lakes and rivers, connected by links of portages, some of them very toilsome to the voyageurs, or French Canadian boatmen, who must carry canoes and packages over them. From Fort William on Lake Superior to Cumberland House the distance is 1018 miles; from Cumberland House to Fort Chipewyan, 840 miles; from Fort Chipewyan to Fort Resolution on Great Slave Lake is 240; the Mackenzie issues from Great Slave Lake; the first fort on it, Fort Simpson, is 338 miles from Fort Resolution; the second, Fort Norman, is 236 miles lower down than Fort Simpson; and Fort Good Hope is 312 miles below Fort Norman, or 886 miles from Fort Resolution. Yet the clerks in charge of these forts (who are mostly all Scotsmen) look upon each other as neighbours.

Lord Selkirk and Sir Alexander Mackenzie have both left full descriptions, from personal observation, of the manner in which the details of fur-dealing are conducted. During Sir Alexander's connection with the trade in Canada, the North-West Company were in the habit of penetrating to the great distance of 4000 miles to the westward of Montreal. In the service of the establishment were fifty clerks, seventy-one interpreters, and 1120 canoe men. A great number of these individuals were Indians, or half-breeds, and their wives and children, who generally accompany the expeditions, amounted to about seven hundred persons. This great body of people embarked every spring, in different divisions, in slight canoes of bark, upon rivers newly freed from the ice, and coursed along them, encountering at every step difficulties and dangers, from rocks, rapids, and other natural obstacles. The slender boats were always heavily laden with provisions for the party, and goods of various kinds, particularly arms and clothing, to exchange for the furs. On reaching Lake Superior, where the company had their chief winter stations, the expedition met parties who had spent the winter there, engaged in collecting the furs, and two months were spent in the settlement of debts and other affairs. The furs were then packed in August, and embarked in a portion of the canoes for Montreal: while the remainder proceeded, with the articles necessary for the traffic, to different posts in the Indian country, there to remain in log-huts for the winter, and collect a fresh stock of skins. Sir Alexander Mackenzie spent many years of his life in this employment, and made those discoveries respecting the geography of the regions to the N.W. of the lakes, which revived the prospect of a north-west passage.

The annual quantity of skins collected by the North-West Fur Company, during Sir Alexander's connection with it, is stated by him as follows:—Skins of the beaver, 106,000; the bear, 2100; the fox, 5500; the otter, 4600; the musgreash, 17,000; the marten, 32,000; the mink, 1800; the lynx, 6000; the wolverine, 600; the fisher, 1650; the racoon, 100; the wolf, 3800; the elk, 700; the deer, 1950. All these skins are brought to Britain, before being sent, either in a dressed or undressed condition, to the continental market. The purposes to which the different kinds of skins are put are exceedingly various, only a few of them being actually used as furs in clothing. Beaver-skins, for example, are in this country devoted now a-days almost entirely to the manufacture of hats. One portion, besides, of an animal's fur, is applied to purposes which the remainder is inapplicable to, and hence, in order to distinguish these different parts of the same animal's skin, new names are often bestowed on them. Thus the furs best known and most valued in this country, are ermine, lynx, sable, fitch, American squirrel, chinchella, and silver bear, some of which are derived from animals mentioned in Sir Alexander Mackenzie's list, while others are from animals which do not appear to have been then in use in the trade. Of all these furs, ermine is the finest, and one of the most expensive. A skin, purely white in the body, and black at the end of the tail, is considered as of the best quality. Many attempts, of course, are made to imitate ermine, by dying inferior skins. Fitch, sable, and lynx, are the most durable of furs, and bear a high value. The squirrel and chinchella furs are exceedingly elegant, but do not last very long. They are of a grayish tint. Fine bear-skins are of great value in the fur trade, and are manufactured into articles of much beauty as well as durability. It ought to be mentioned, that the fur companies trade extensively in buffalo-skins, though no furs are derived from any animal of that class. An immense number of animals of other kinds are also frequently killed in the arctic regions, the bodies of which serve as food to the hunting parties. A party of eighty men killed and consumed, in one winter, 90,000 white partridges, and 25,000 hares. The waters of Hudson's Bay are stocked with the grampus, seal, narwal, sea-horse, and other creatures, of which many hundreds are killed annually, and their skins, particularly those of the seal tribe, added to the general store.

The importations of fur-skins into England in 1835 were:—

	British North American Colonies.	United States.	Total from all Countries.
Bear,	4,829	10,184	15,041
Beaver,	85,933	2,316	88,400
Fitch,	12	[illegible]	47,586
Marten,	71,068	47,253	159,954
Mink,	25,297	82,950	115,501
Musquash,	1,147,725	23,232	1,117,659
Nutria,	4	——	557,600
Otter,	17,989	143	18,374
Seal,	322,186	2,081	339,683

The numbers re-exported in the same year of those species of which the Custom-house Returns have been given, were:—

Countries to which exported.	Bear.	Marten.	Musquash.	Otter.
Russia,	331	——	——	——
Prussia,	85	——	——	650
Germany,	8,753	5,106	6,507	13,157
Holland,	207	351	50,425	[illegible]
Belgium,	——	188	——	——
France,	1,663	11,222	——	——
Italy,	229	——	——	——
Turkey,	——	281	——	——
China,	——	——	——	520
U. S. of America,	146	813	164,558	9,912
	11,414	17,961	221,490	24,444

In 1836 the number of undressed furs entered for home consumption was:—Bear, 2322; beaver, 87,473; cat and lynx, 58,937; coney, 665,991; ermine, 284,488; fitch, 122,741; fox, 18,977; marten, 197,804; mink, 62,467; musquash, 784,379; nutria, 1,328,017; otter, 952; racoon, 1525; and squirrel, 2,236,725.

An idea is entertained by some persons that the races of wild animals whose skins are an article of commerce will some day be extinct, owing to the rivalry of traders; and it may follow that furs will be so scarce as to be handed down from one generation to another by will, as was the case a few centuries ago. This however is an anticipation not likely to be realized. The textile materials of dress, especially wool, are much superior in their quality, and, when in a manufactured state, form a better protection from the weather than at any previous period; and we are consequently past the age of wearing skins, which, in the history of costume, precedes the improvement of manufactured fabrics. But if the extermination of wild animals should nearly ensue, the supply of furs would not on that account cease, as a sufficient number of animals would be domesticated solely for the sake of their skins. This is already done to some extent in the north of Europe. Mr Laing, in his interesting "Notes on Norway," says—"The fur or skin used for their winter pelisses by the "Fjelde" people is really handsomer, although much cheaper, than that of the wolf or bear. It belongs to a particular kind of dog, with a remarkably fine, soft, and glossy fur. These dogs are bred for the sake of their skins; and it appears to me that many of the best of the dark brown or black muffs and tippets of our English ladies are merely well-selected skins of these Fjelde dogs. A pelisse of such fur costs about £3 9s., while that of wolf-skin costs from £7 10s. to £9 10s." J. H Pelley, Esq., Governor of the Hudson's Bay Company, in his evidence before a committee of the House of Commons, March, 1837, says that the Company now maintain beaver preserves in their territories.

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GADOLINITE; a rare Swedish mineral, containing the very scarce earth *Yttria.*

GAINSBOROUGH; a market-town of England, in the county of Lincoln, situated on the east bank of the Trent, 149 miles N. by W. from London. It consists chiefly of one long street running parallel with the river, and is a place of considerable foreign as well as inland trade, for which its situation is well adapted. The Trent is here navigable for ships of 200 tons burden, and by different canals it extends its navigation through the interior of the country. The tide rises here very rapidly. The place is of considerable antiquity: It was here where Alfred the Great celebrated his nuptials in 868. Population in 1841, of town and parish 7860.

GALACZ; a port of the Danube, in Moldavia, in lat. 45° 25′ N., long. 28° E. Its population amounts to about 12,000. Of late, this place has risen into considerable importance as a place of commerce, and steam-boats have been established between it and Constantinople and Trebezon and the Black sea. There are also steam-boats from Presburgh in Hungary to Galacz. The main trade is carried on by Greek merchants.

GALASHIELS; a thriving town in Selkirkshire, Scotland, situated on the right bank of the Gala, a small river celebrated in Scottish song; distant from Edinburgh about thirty-one miles, and five from Melrose. The old village of Galashiels, which was merely an appendage of the baronial seat of Gala, in the vicinity, is now abandoned and destroyed. The present town is of comparatively modern erection, having been begun not more than fifty years since, on the people manifesting a tendency to remove nearer the river, in order to engage in manufactures. It consists of one long street, with some by-lanes, and scattered clusters of houses, all built of blue whinstone, and slated. The inhabitants are remarkable for their persevering industry and enterprise in the woollen manufacture. Galashiels ranks, indeed, as the first town in Scotland for the manufacture of woollen cloth, and the spinning of woollen yarn. Situated in the midst of an extensive pastoral country, which yields an abundance of wool, it has adopted almost the only species of manufacture and traffic it had a chance of prosecuting with success, and although labouring under the serious disadvantages of having expensive inland carriage, and being at a considerable distance from coal, it has overcome such difficulties, and is now a flourishing little place. The parish, which comprises the ancient parishes of Bolside and Lindean, is, besides the Tweed, intersected by the Etterick and the Gala, both celebrated among the beautiful pastorals of Burns. It contains about 8000 acres, the surface of which is hilly, and in some parts mountainous; Meg-Hill, rising to the height of 1480 feet above the level of the sea, but affording the finest pasture for sheep, in rearing which, principally for the sake of the wool, great attention is paid by the proprietors. Schistus and whinstone abound here; and the presence of red ochre, chalybeate springs, &c., indicate also the existence of iron. Population in 1841, 2140.

GALT, John, an eminent Scottish novelist and miscellaneous writer, was born at Irvine, in Ayrshire, May 2, 1779, being the eldest son of a person engaged in mercantile pursuits. He spent his first ten or eleven years at Irvine, and there received the rudiments of his education. Being a sickly boy, he became addicted to study, and he used to take great pleasure in hearing tales of foreign adventure from any one who could relate such to him. In his eleventh year, the family removed to Greenock, where he pursued his studies at the public school, under Mr Colin Lamont, and prosecuted still farther his taste for reading, which was much facilitated by an excellent public library to which he had access. He also manifested a turn for mechanics, which, joined to a taste for music, prompted him to attempt the construction of a small piano-forte or hurdy-gurdy, and likewise an Eolian harp. In these early years he composed some pieces of music, one or two of which became popular. What gives a more striking proof of the early developement of his reflective powers, is, that he conceived the idea of several local improvements of great magnitude and importance, some of which have since taken place. He formed an intimacy with a young man of taste and talent, Mr James Park, who appears to have been of great service to him. The two youths cultivated the belles lettres together, and mutually criticised each other's productions. It does not appear that Mr Galt distinguished himself at school: he was thought, even by his mother, to be a dull and sleepy boy, which was in a great measure owing to the state of his health, which did not become good till he reached manhood. In due time he entered the counting-room of Messrs James Miller and Company, in order to learn the mercantile profession, and here he seems to have continued for several years. A circumstance much to his praise falls to be noticed at this period of his life. His father had intended to leave his mother independent; but, owing to some informality, on the death of the old gentleman it was found that his whole property fell into the hands of his heir-at-law, the subject of this memoir. Mr Galt instantly executed a deed, fulfilling the intentions of his father.

As he advanced into the full bloom of youth, Mr Galt entirely lost his inenergetic character, and became remarkable for that decision, which, whether for good or evil, ever afterwards characterized him. About the year 1804, having received an insult from a mercantile correspondent, he took upon him to resent it in a very prompt and stern manner, which seems to have rendered his situation at Greenock too unpleasant to be any longer endured. He accordingly went to London, and began a mercantile career in company with one M'Lauchlan, which ultimately proving unfortunate, he entered at Lincoln's Inn, with a view to the English bar, and meanwhile, for the sake of his health, in 1809, made a tour of the Mediterranean. At Gibraltar he encountered Lord Byron and Mr Hobhouse, in whose company he sailed to Sicily, and whose acquaintance he thus formed. From Sicily, he proceeded to Malta, and thence to Greece, where, at Tripolizza, he conceived a scheme for forming a mercantile establishment in the Levant, to counteract the Berlin and Milan decrees of Napoleon. The conception was instantaneous, and seemed at first so promising as almost to turn his brain. After touching at Smyrna, he returned to Malta, where he found Messrs Struthers, Kennedy, and company, apprised by Mr Kirkman Finlay's house in Glasgow, of a plan similar to his, which had been suggested by one of their partners resident at Vienna. He was astonished at the coincidence, but resolved to wait till the house at Malta should correspond with that at Glasgow respecting his scheme. In the meantime, he proceeded to inspect the coasts of the Grecian archipelago, and to ascertain the safest route to the borders of Hungary. After an exploratory expedition, in which he satisfied himself of the practicability of introducing goods into the continent by this circuitous channel, he returned by Sardinia and Gibraltar to Britain (August, 1811), landing first in Ireland. He busied himself for a time in applications to the government, on the subject of his Levant scheme, but found great difficulty in attracting any attention. Meanwhile, he prepared and published a quarto volume descriptive of what he had seen in his travels, being his first avowed work. It was not very favourably received, and has long passed out of notice. He never reaped any good from the project which had occupied his thoughts so much, though it was soon after acted upon to a considerable extent and with advantage to those concerned. Mr Kirkman Finlay proposed to give him a principal share in superintending a mercantile concern established by his house at Gibraltar, and he closed with the offer. At Gibraltar, however, he found himself out of his element: he confesses he never could lay his heart to any business in which the imagination was not engaged. His health became bad, and the concern was ruined by the successes of the Duke of Wellington in Spain. He returned to London, and soon after became connected with the *Star* newspaper, and married Elizabeth, daughter of Dr Alexander Tilloch, proprietor of that paper, and editor of the Philosophical Magazine, by whom he had a family. He also published about this time the Life of Cardinal Wolsey, 1812, 4to; Reflections on Political and Commercial Subjects, 1812, 8vo: Letters from the Levant, 1813, 8vo; the Life of Benjamin West, 1816, 8vo; the Majola, a tale, 1816, 2 vols; and a number of minor biographies and plays, the most of the latter appearing in a periodical work called the Rejected Theatre. But his first really successful appearance as an author was in a series of articles, which appeared in the year 1820, in Blackwood's Magazine, styled "The Ayrshire Legatees." In this work, which eventually formed a separate volume, he showed a power of delineating a certain line of Scotch characters, that struck the public mind, especially in Scotland, very forcibly. Sir Walter Scott had already given some admirable pictures; but he had never come so exactly into the very heart of a real Scotch matron of the middle ranks, as Mr Galt now did. Mr Blackwood saw that this was a new vein, and he encouraged Mr Galt in prosecuting it. A volume, written earlier, but for some years neglected, was now published, under the title of "The Annals of the Parish." It was intended by the author as a kind of Scottish Vicar of Wakefield; and it certainly possesses much of the household humour and pathos of its admirable model. About this time, the author had come to Scotland, chiefly with a view to the education of his children; and for some years he lived in Eskgrove House, near Musselburgh. He now issued in rapid succession, The Provost, The Steamboat (each one volume), Sir Andrew Wylie, and the Entail (each three volumes), and the Gathering in the West, which related to the flocking of the west-country people to Edinburgh at the period of the king's visit. In all of these works, the peculiar vein of Scottish character which Mr Galt had hit upon, formed the main attraction, and their merits were upon the whole handsomely acknowledged by the public. It could only be urged by critics of strictly just taste, that there was an unfortunate coarseness in many of Mr Galt's pictures, and a mean style of moral feeling in many of his characters, which could not justly be considered as a fair representation of the people from whom they professed to be derived. Another series, published by Messrs Oliver and Boyd, consisted of Ringan Gilhaize, The Spaewife, and Rothelan. They fell under the denomination of historical romances, and were not generally deemed happy efforts. Upon the whole, any distinctive merit which Mr Galt possessed as an author, may be said to have been exclusively in his power of describing a homely specimen of his countrymen, which he almost always did with truth and effect, though, as intimated, with far too much of the selfish feeling attributed to the character. He generally failed in any higher flight.

From about the year 1824 to 1830, Mr Galt was occupied in the business of acting manager and superintendant of the business of an emigration company in Upper Canada, which required his almost constant residence in that country and appears to have yielded him a salary of a thousand a year. The company, however, did not at first prosper, and he was discharged at the last, in what appears to have been a very harsh manner. The consequence was an embarrassment in his affairs, which obliged him to become bankrupt. In London he again commenced the business of an author, and produced in quick succession, Lawrie Todd (a singularly happy and successful novel), Southennen, Bogle Corbet, Stanley Buxton, and Eben Erskine—all of which were in three volumes each—with the Life of Lord Byron (written for the National Library), the Lives of the Players, (2 vols. for the same series), the Member and the Radical, political tales in one volume each. In the midst of these honourable exertions for the support of his family and the discharge of his debts —for both objects seem to have been in his view, and the latter to a certain extent accomplished— he was, in July 1832, struck with paralysis, and was removed to his relations in Greenock, where he remained an invalid till his death, on the 11th April, 1839, having been visited by a succession of paralytic shocks to the amount of fourteen, which although they deprived him of the power of his limbs, and latterly even of the power of holding a pen, still left his mental faculties so far unimpaired as to enable him, during his illness, to write or dictate his Autobiography, 2 vols., his Literary Life and Miscellanies, 3 vols., besides a variety of minor tales and sketches, which appeared in the Magazines and Annuals. Among his latest productions was a tale, called The Bedral, which was not inferior to his Provost Pawkie. Mr Galt, it will be seen, was a most prolific author, and yet the works we have mentioned form by no means a complete list of his publications. He himself was unable to furnish one. In a list which he made, he forgot an epic poem—and he afterwards jocularly said, that he should be remembered as one who had published an epic poem, and forgot that he had done so. Literature with him was but a secondary pursuit, and his mind was chiefly engrossed by mercantile or mechanical projects. During his last illness at Greenock, this "ruling passion" strongly displayed itself. He had a variety of schemes, to which he invited the attention of the scientific world, among others a plan for deepening the Clyde up to Glasgow, by erecting a dam, with lock, at Bowling Bay. This, he said, was the legacy he left to Glasgow, in gratitude for the many good deeds done to him by inhabitants of that city. Mr Galt was in person tall and muscularly formed, his manners being frank and agreeable. During much of his life he moved in the best circles of society; and it is not the least curious circumstance in his character that, with so much high-spirited gentlemanly feeling in himself, he should have mainly succeeded in depicting the meaner and more grovelling points in human nature.

GELL, Sir William, Knt., M.A., F.R.S., and F.S.A., a member of the Society of Dilletanti, &c. was the younger son of Philip Gell of Hopton, Derbyshire, Esq., by Dorothy, daughter and coheiress of W. Milnes, of Aldercar Park, Esq., who was secondly the wife of Thomas Blore, Esq., F.S.A., the historian of the county of Derby. He was formerly Fellow of Emanuel college, Cambridge, where he graduated B. A. 1798, M. A. 1804. His learned and valuable works were produced in the following order:—The Topography of Troy and its Vicinity, illustrated and explained by drawings and descriptions. 1804. fol. The Geography and Antiquities of Ithaca. 1808. 4to. The Itinerary of Greece, with a Commentary on Pausanias and Strabo, and an account of the monuments of antiquity at present existing in that country. 1810. 4to. The Itinerary of the Morea; being a particular description of that Peninsula, with a map of the Routes. 1817. 8vo. Pompeiana; or Observations upon the Topography, Edifices, and Ornaments of Pompeii. By Sir William Gell and J. P. Gandy, Esq., 1817—1819, 8vo. Second volume, 183-, 8vo. It was this work, equally beautiful and interesting, which made his name most extensively known. Attica. 1817. folio. Narrative of a Journey in the Morea. 1823. 8vo. The Topography of Rome. 183-, 8vo. Sir William Gell received the honour of knighthood on a return from a mission to the Ionian Islands, May 14, 1803. In 1820 the late queen Caroline appointed him one of her Chamberlains, in which capacity he attended daily during the examination which was called her "Trial," in the House of Lords. Subsequently to that period Sir William had resided altogether in Italy. He had a small house, surrounded by a pleasant garden, at Rome; and a picturesque residence at Naples, which reminded the visitor of some of his own drawings of Pompeii. Both were the daily resort of the scientific and literary visitants to "the Eternal City" or the gay "Parthenope;" and in his reception room in each he was seen, surrounded by books, drawings, and maps, with a guitar, from which he frequently drew forth pleasant discourse, and two or three dogs, so well bred as to be a source of amusement instead of annoyance to his visitors.

Sir William Gell's residence at Naples was for many years rendered peculiarly agreeable by its vicinity to that of his estimable and erudite friend, the late Sir William Drummond, with whom he lived on terms of affectionate intimacy; and whose death, which took place at Rome in 1827, he deeply lamented. The hon. Richard Keppel Craven had been for many years the friend of Sir William Gell. In 1834, Sir William's infirmities had increased so much that he was compelled to give up his residence at Rome, and remain stationary at Naples. Those who had opportunities of appreciating the character of this amiable man knew not which most to admire,—the depth and versatility of his erudition, the benevolent kindness of his heart, or the suavity of his manners. Suffering from the complicated tortures of gout and rheumatism, which for many years deprived him of the use of his limbs, his patient endurance of pain, and constant cheerfulness under it, endeared him to all who knew him. Science and literature had not a more devoted adherent, or more ardent admirer. Deeply skilled in antiquarian learning, the fruit of his indefatigable researches was ever at the service of others; and he was in every sense of the word a scholar and a gentleman. He died at Naples on the 4th Feb. 1836, aged 59. His body was interred in the English burial ground at Naples.

GEOLOGY, Recent Progress of. After Hutton and Werner had advanced their respective theories, an intellectual warfare of many years was rather fiercely waged between their followers. Although this excitement led to the elucidation of many important parts, yet it cannot be denied that much time and some talent were unprofitably lost in the contest, till at last the Wernerians, in the great points at issue, fairly gave in; and the leading *facts* at least of the Huttonian theory were universally established, namely, the igneous origin of granite and trap rocks, and the sedimentary nature of the other deposits. Meanwhile practical geology, founded on actual investigation, was making considerable progress, first in England, by the solitary and untutored labours of Mr Smith, who, almost unaided, produced a map of the English strata, arranged according to their organic remains, and the result of his own personal investigations; and afterwards by the institution of the London Geological Society, in 1807, which ranked among its members Dr Maculloch, the able investigator of the primary rocks, and of the trap formations of Scotland and its islands, Mr Conybeare, who, along with Mr Phillips, published a work on the secondary strata, as exhibited in the English districts from the carboniferous series, up to the oolite, and chalk, and Messrs Greenough and Webster, and professors Buckland and Sedgwick, Messrs Murchison, Lyell, &c., who have all contributed most valuable papers to its transactions. On the continent the celebrated Cuvier and his associates, Lamarck and Brogniart, were no less assiduous in their energetic investigations. The discoveries of Cuvier in the strata of the environs of Paris formed a new era in the history of organic remains, and gave an interest and impulse to the study of geology beyond what had been before experienced. Cuvier, indeed, may be said to be the Newton of geology, and had his attention been solely devoted to this science, or rather could he have had his ever active existence prolonged beyond the period of humanity, we might have hoped from his acute and comprehensive intellect, joined to his laborious investigation of facts, as complete an elucidation of the phenomena of geology as Newton has bequeathed us of the solar system.

Of the more recent systems of geology, Mr Lyell's is the most conspicuous. In its leading features it is identical with that of Dr Hutton, and of his classical illustrator, Mr Playfair. Mr Lyell maintains the same infinitude of operations, the same wearing down of old continents, and the resurgence of new ones. He, however, disclaims the interference of all causes except those that are strictly in operation at present, not even allowing an intensity of power beyond what is daily manifested on the earth's surface. In this way he rejects the paroxysmal fusions and elevations of rocks by the unexplained "central heat" of Hutton and Playfair, and accounts for the elevation of strata to the slow and progressive effects of igneous action, as exemplified in existing volcanoes. Thus an infinitude of movements, consisting of a progressive decay and renovation of strata, graduating by imperceptible steps into each other, make continually the circuit of the earth's crust, and to accompany these movements in the inorganic mass a progressive development and destruction of animal and vegetable life take place coincidently, so that system succeeds system, merging into, and embracing each other, like cycle and epicycle, where neither beginning nor end is perceptible. To elucidate these views, Mr Lyell has accumulated a mass of most interesting facts regarding volcanic phenomena, and adopting the hint of Cuvier, has personally investigated the newer strata in the volcanic districts, so as to enable him to trace a chain of formations from the oldest visible systems up to those which have had their origin in the present times. While these investigations were being made of the newer formations, Mr Murchison and professor Sedgwick were exploring the older sedimentary deposits in England and Wales. Many of these formations, which were at one time supposed to contain few or no traces of organic remains, were now found to exhibit many species of new and unknown molluscous and vertebrated animals. Fortunately, to aid the investigations of these zealous geologists, the researches of professor Aggassiz in ichthyology were at hand to throw light on the remains of fishes which were found in the older sandstones and slates. From their combined labours, the transition series of rocks hitherto undefined, were arranged into regular groups, characterized by peculiar fossils; and a splendid work was given to the public explanatory of this system. (See *Silurian System.*) Dr Maubel too, was labouring in the investigation of the fresh water formations of the wealds of Sussex, and made discoveries of the existence of huge reptiles, as well as plants and minute animals in that deposit (see *Wealden*), while Dr Hibbert was exploring the fluveabile limestones of the south of Scotland.

On the continent, Elie de Beaumont deduced his theories of periodical elevations of mountain chains, from an inspection of the parallelism of particular mountain formations; Boué carried on his geological surveys; and Erenberg, by the aid of the microscope, showed that some of our solid tripoli stones and chalk masses owed their existence to millions of minute animalcules in a fossilized state; while in America, Dr Hitchcock traced the foot marks of gigantic birds, who had stalked over the ancient sand beds, and left the impressions of their footmarks alone behind. (See *Ornithicnites.*) The same zeal for geological investigation has been carried by young travellers into every region of the globe. In the lower range of the Himmala mountains, Dr Falconer and Capt. Cantly discovered the remains of several new mammalia, (see *Sivatherium*) and communications of interest are daily emanating from other cultivators of the science. "When we compare," says Mr Lyell, "the result of observations in the last thirty years, with those of the three preceding centuries, we cannot but look forward with the most sanguine expectations to the degree of excellence to which geology may be carried even by the labours of the present generation. Never perhaps did any science, with the exception of astronomy, unfold, in an equally brief period, so many novel and unexpected truths, and overturn so many preconceived opinions. The senses had for ages declared the earth to be at rest, until the astronomer taught that it was carried through space with inconceivable rapidity. In like manner was the surface of this planet regarded as having remained unaltered since its creation, until the geologist proved that it had been the theatre of reiterated change, and was still the subject of slow but never ending fluctuations. The discovery of other systems in the boundless regions of space, was the triumph of astronomy; to trace the same system through various transformations, to behold it at successive eras adorned with different hills and valleys, lakes and seas, and peopled with new inhabitants, was the delightful meed of geological research. Whether the investigation of the earth's history and structure will eventually be productive of as great practical benefits to mankind, as a knowledge of the distant heavens, must remain for the decision of posterity. It was not till astronomy had been enriched by the observations of many centuries, and had made its way against popular prejudices, to the establishment of a sound theory, that its application to the useful arts was most conspicuous. The cultivation of geology began at a later period, and in every step which it has hitherto made towards sound theoretical principles, it has had to contend against more violent prepossessions. The practical advantages already derived from it have not been inconsiderable, but our generalizations are yet imperfect, and they who follow may be expected to reap the most valuable fruits of our labour. Meanwhile the charm of first discovering is ours, and as we explore this magnificent field of inquiry, the sentiment of Niebuhr the great historian of our times, may continually be present to our minds, that "he who calls what is vanished, back again into being, enjoys a bliss like that of creating."

GHAZEEPORE, OR GAZYPOOR; a town in Hindostan, long celebrated for its rose-water, is the capital of a circar or province of Hindostan, of the same name. It is situated on the left bank of the river Ganges, forty-one miles north-east of Benares, and ninety-two miles east of Allahabad. It is described by bishop Heber as a large town or city, and when viewed from the river, as presenting a very striking appearance, though on a nearer inspection, its noblest buildings are, as is too often the case in Indian towns, found to be in a miserable state of ruin. The native city itself is, however, better built, and better kept, than many other places of more importance. The bazars are neat and well supplied, and bishop Heber, describing the place, says, "One of the streets was so wide, one might have supposed oneself in an English country town." But he adds, "the town has no large houses except one, the property of a wealthy Mussulman, which is extremely like some of the old houses in Scotland, as represented in prints, and described by the author of Waverley. Like all other native buildings, it looks dingy and neglected, but appears in good substantial repair, and is a striking object, more so, perhaps, than most of the Corinthian verandahs at Calcutta. There are moreover, the remains of an old castle here, now reduced to little more than a high green mound, scattered with ruins, and overhung with some fine trees."

Although the neighbouring population is chiefly Hindoo, a very considerable portion of the inhabitants of the town are Mussulmans. Their mosques here are more numerous, or at least more remarkable, than the pagodas. Indeed, although, taking the whole province together, they form but barely an eleventh part of the population, and amongst the remainder, Hindooism exists in all its strength and bigotry, yet as it is in the large towns that the Mussulmans chiefly abound, they sometimes appear here in such numbers, in the shops and streets, as to lead persons to believe that they bear a more considerable proportion to their Hindoo brethren.

"At the eastern extremity of the town," the bishop relates, "is a very handsome, though ruined palace, built by the Nawab, Cossim Ali Khan, the most airy and best contrived, so far as can be perceived from its outward appearance, of any of the eastern buildings I have seen. Its verandahs are really magnificent, but its desolation is so recent, that it is very far from being a pleasing object on approaching near enough to perceive its decay. It is approached from the land through a fine stone gateway, which, though differing in a few particulars from the English Gothic, certainly belongs to the same style of architecture. This is in good repair, and has still its massive teak folding-doors clenched with iron studs, and with the low-browed wicket in the middle, like an English castle or college.

"At the other extremity of the town, and separated from it by gardens and scattered cottages, are the houses of the civil servants of the company, mostly with ground-floors only, but large and handsome. They are surrounded by good gardens, and occupy picturesque situations amidst tame but luxuriant scenery, where the green lanes, flowering hedgerows, and receding glades, bring to mind some of the most cultivated portions of England. Beyond these is the military cantonment, ugly low bungalows, with sloping roofs of red tile, but deriving some advantage from the trees with which they are surrounded and intermingled. The most conspicuous building among them is the monument to lord Cornwallis, who died here on his way up the country."

Ghazeepore is noted for the wholesomeness of its air, and the beauty and extent of its gardens. The British regiments removed hither from the other stations, have, it is said, always found the number of their deaths diminish from the Indian to the European proportion.

The precious incense of the rose, the *atta-gool*, so celebrated throughout all the civilized parts of the world, is produced in considerable quantities in the gardens round Ghazeepore. The cultivation of roses at Ghazeepore is a mere matter of business, and the extensive fields, though planted with roses, do not appear so beautiful and attractive as might at first be imagined. The fact is, the Indian rose, though its very name seems to imply distinction, can only sustain a comparison with its European sisters in the fragrance which it yields. It is beautiful, for could a rose be otherwise? But excepting at Agra, it does not attain to the magnificent size common in England, nor does it present the infinite varieties which adorn our gardens. The roses of eastern climes bloom sparingly upon a low shrub, which is kept to a dwarfish size by the gardener's knife, and the full-blown flowers being gathered every morning, the trees rarely present the luxuriance of loaded boughs, drooping beneath the weight of their silken treasures. The roses of Ghazeepore are planted formally, in large fields, occupying many hundred acres in the neighbourhood. The flush of their flowers, when opening to the morning ray, and enamelling the verdant carpet of green spread over a sun-lit plain, cannot, however, fail to delight the eye. The gathering of the roses is performed systematically by a multitude of poor labourers, who carefully secure every full-blown flower. The first process which these undergo is that of distillation. The *goolāābee pāānee*, rose-water, thus obtained is poured into large vessels, which are exposed uncovered to the open air during the night. The jars are skimmed occasionally, the essential oil floating on the surface being the precious concentration of aroma which is so highly prized.

GILLIES, John, LL.D., F.R.S., F.A.S., member of many foreign societies, and historiographer to his late Majesty for Scotland, was born at Brechin, in the county of Forfar, on the 18th of Jan. 1747. He was educated at Glasgow, where, when under twenty years of age, he was chosen to teach the Greek class in the illness and decline of the then aged professor of Greek in that university. He soon, however, resigned that appointment, and came to London, with the view of making literature his sole pursuit; and, in furtherance of this object, he spent some time on the continent to acquire facility in the modern languages. Soon after his return, being yet a young man, that connection with the Hopetoun family commenced, to which he always ascribed much of the happiness and prosperity of his long life, this friendship having subsisted between them from that period without an intervening cloud. John, the second earl of Hopetoun, to whom he had been introduced by his eldest son lord Hope (the late James earl of Hopetoun), invited him to travel with his second son, the hon. Henry Hope, and induced him to relinquish some honourable and lucrative literary engagements, by settling upon him, in the year 1777, an annuity for life. Henry Hope died abroad, and a few years afterwards, Dr Gillies went again to the continent with the younger sons of the same earl of Hopetoun, John and Alexander Hope. Mr Gillies returned with his companions about the year 1784, when he resumed his literary labours, and took his degree of LL. D,, previously to the publication of the first part of his Grecian History. Upon the death of his friend Dr Robertson he was appointed historiographer to the King for Scotland. In 1794, he married. He continued his literary industry to a late period of life. The infirmities of age showed themselves principally in the weakness of the lower limbs, which made it dangerous to pursue his accustomed walks in crowded streets. Finding himself contented with domestic comfort, he retired altogether from the world, and settled at Clapham in the year 1830, where he died on the 15th Feb. 1836.

The following is a list of the works of Dr Gillies:—Orations of Isocrates and those of Lysias, translated; with some account of their lives, and a discourse on the history, manners, and character of the Greeks, from the conclusion of the Peloponesian war to the battle of Chæronea. 1778, 4to. History of Ancient Greece, its colonies and conquests, from the earliest times till the division of the Macedonian Empire in the East; including the history of philosophy, literature, and the fine arts. 1786, two vols. 4to. and four vols. 8vo. View of the reign of Frederic II., of Prussia, with a parallel between that Prince and Philip II., of Macedon. 1789, 8vo. Aristotle's Ethics and Politics, comprising his practical philosophy, translated from the Greek; with notes, the critical history of his life, and a new analysis of his speculative works. 1797, two vols. 4to. Second edition, 1804, two vols. 8vo. Supplement to the Analysis of Aristotle's Speculative Works. 1804, 4to. History of the World from Alexander to Augustus, 1807-10, two vols. 4to. Translation of Aristotle's Rhetoric. 1823.

GLAMORGANSHIRE; a county of South Wales, extending from east to west forty-eight miles, and from north to south, twenty-seven. It has one city, Llandaff; one county-town, Cardiff; is divided into ten hundreds, viz., Caerphilly, Cowbridge, Dinas-Powis, Kibber, Langwelach, Miskin, Neath, Newcastle, Ogmore and Swansea, and into 118 parishes. It returns two members to parliament, who are polled at Bridgend, Cardiff, Swansea, Neath, Merthyr-Tydvil. The north and north-east parts of the county are mostly barren and mountainous; the southern portion, on the other hand, is level and fertile. In the fine plain expanding from the foot of the mountains on the north to the Bristol channel on the south and south-west, known by the name of the Vale of Glamorgan, and extending the whole length of the county. The soil is deep and rich, and the salubrious temperature of the climate is such that the families of myrtles, magnolios, and other delicate plants, not only live but thrive in the open air. Here agriculture is practised upon the most approved principles, and the abundant produce of every description has procured for it the appellation of "the Garden of Wales." This valley, which is in many places from eight to eighteen miles in breadth, is divided from nearly one end to the other by the great post road from London to Milford. Passing along this road the traveller enjoys some of the most extensive and picturesque views that are to be met with in the whole island. The rivers of the county are the Rumney, the Taaf, the Ogmore, the Neath, the Tavy, the Avon, the Llanry, the Ewenny, and the Loughor. All of them have a southerly course, and several of them have their sources among the mountains of Brecon. The coast has a fine semi-circular sweep nearly the whole length of the county, the western point of which is formed into a peninsula by an arm of the sea running up towards Carmarthen, forming an estuary at the mouth of the Barry river. Over a fine sandy beach the limestone rocks in many places swell into perpendicular cliffs of great boldness, exhibiting many organic remains, and worn in many places into deep and lofty caverns. The canals of the county are the Glamorganshire canal, which extends from Merthyr-Tydvil to Cardiff, a distance of twenty-five miles. The Aberdare navigation unites with this canal at New-Bridge, and that again, by the Aberdare railway, is connected with the Neath canal, thus uniting Cardiff, Merthyr-Tydvil, and all the intervening country with the noble bay of Swansea. Another canal, running parallel to the river Neath, connects the bay of Swansea with the distant and rugged hills of Brecon. The mineral wealth of the county consists principally of coal of various kinds, lime-stone, possessed of peculiar qualities, and iron-stone. Lying frequently at small depths from the surface, and frequently jutting out from the sides of the hills, these minerals are raised here with less expense than in most other places of the kingdom. The whole valuable mineral of the county, especially the southern part of it, rests on a bed of lime-stone. The most plentiful kind of this lime, though not the best for the purpose of building, is well adapted, from its extreme whiteness, for white-washing, and from its other qualities for manure; vast quantities are exported across the channel into Somerset, besides what is sent round the coast to other places in Wales. One kind of lime here possesses the property of hardening under water, which renders it highly valuable as a sub-marine cement. Beneath the limestone, are found beds of red earth resembling tripoli, and in this earth are found beds of gypsum, the finest yet discovered in Britain. In the white limestone lead-ore, calamine, manganese, and copper have also been discovered though in small quantities. Coal, which is of still more importance, seems to be equally universal in its diffusion, and with iron-stone, which is also abundant, forms the great staple of the county. Of the former much is exported, and a vast quantity is more profitably employed in the immense smelting establishments of Merthyr-Tydvil, Neath, Swansea, Aberdare, and Abernant. The works at the former of these places, which are among the most extensive in Europe, are all iron-works, of which the material is dug up in the neighbourhood; but in different places, particularly Neath and Swansea, there are large establishments for the smelting of copper, the ore of which is imported from Ireland, Cornwall, and North Wales; lead is also brought hither for smelting in large quantities. Tin-plate is also manufactured to a large extent in some places, particularly at Merlin-Gruffyd, the tin being imported from Cornwall. Flags and marble form also articles of exportation, and give employment in cutting and polishing to a number of the inhabitants. Population of the county in 1841, 171,188.

GLASTONBURY; a market-town of Somersetshire, situated nearly in the centre of the county, distant from London 124 miles W.S.W. It consists of two streets crossing each other nearly in the direction of the cardinal points, and many of the houses are built with stones taken from the ruins of its celebrated abbey. The foundation of this abbey is ascribed to Joseph of Arimathea, and Glastonbury is said to have been the place where the first Christian church was planted. "This tradition," observes Mr Southey, "may seem the more deserving of credit, because it is not contradicted in those ages when other churches would have found it *profitable* to advance a similar pretension." There can, indeed, be no doubt that this tradition was one of the great causes of the high patronage and rich endowments which the abbey possessed from a very early period: and we may rest assured, that if in behalf of any other church in England an equal claim could have been advanced to the assumption of such titles as those conferred on Glastonbury, as "the first ground of God;" "the first ground of the saints in England," and "the rise and fountain of all religion in England," such a manifest advantage never would have been conceded to this establishment without many a struggle. Other accounts say that the abbey really owed its origin to David, a British prelate, in the fifth century, or to Ina, king of Wessex, who began his reign in 689, and by whom, according to William of Malmesbury, the monastery was erected and adorned with great splendour, and at a vast expense, and also richly endowed and favoured with various franchises and privileges, to which additions were made by several succeeding monarchs and other benefactors. It was constituted one of the parliamentary mitred abbeys, and the revenues, at its dissolution under Henry VIII., amounted to £3508. 13s. 4d. A series of abbots, sixty-one in number, presided here during a period of nearly six centuries; and the last of them, Richard Whiting, though he surrendered the abbey, was executed as a traitor, together with two of the monks, for refusing to acknowledge the king's supremacy. Many illustrious persons were interred in the church of this monastery, among whom is supposed to have been the famous king Arthur, whose tomb, with a Latin inscription, is stated, by Giraldus Cambrensis, to have been discovered here in the reign of Henry II. Some fine ruins of the abbey church are still remaining, as likewise a building called the Abbot's Kitchen; and a tower on a hill, near the town, named Glastonbury Tor, a noted sea-mark for ships sailing in the Bristol channel. The foundation plot upon which the Glastonbury abbey and its immense range of offices were erected, included a space of not less than sixty acres, and was surrounded on all sides by a lofty wall of wrought freestone. The principal building, the great abbey-church, consisted of a nave of 220 feet in length, and 45 in breadth; a choir of 155 feet; and a transept of nearly 160 feet; and with the chapel of St Joseph of Arimathea, which stood at its west end, 110 feet in length by 24 in breadth, its extreme length measured the vast extent of 530 feet. Adjoining the church on the south side, was a noble cloister, forming a square of 220 feet. The church contained five chapels,—St Edgar's, St Mary's, St Andrew's, the chapel of Our Lady of Loretto, and the chapel of the Holy Sepulchre. Under the body of the church were three large crypts, supported by two rows of massive pillars, in which lay entombed the remains of many of the most illustrious personages, and under St Joseph's Chapel was another large and handsome crypt, having, in one of its angles, an arched passage, which is said to have been traced for a considerable distance and supposed by some to have led to the Tor.

On the south-west side of Glastonbury may be seen *Weary-all Hill*, which is supposed to have taken its name from a belief instilled into the minds of the ignorant in former days, that here St Joseph and his companions sat down, *all weary* with their journey. From the stick also which Joseph stuck in the ground on that occasion, though then only a dry hawthorn staff, they say sprang the famous Glastonbury Thorn, which blossoms every year at Christmas. The tree, which was considered the original stock, had, in the time of Queen Elizabeth, two trunks, or bodies, when a puritan exterminated one of them. The other, which was of the size of a common man, was still an object of wonder and attraction, and the blossoms were esteemed such curiosities by people of all nations, that the Bristol merchants made a traffic of them, in exporting them to foreign parts. In the great rebellion, during the time of Charles I., the remaining trunk of this tree was also cut down, but others derived from it then existed. Absurd as is the account of the origin of this thorn, still there can be no doubt that it is an early variety of the common hawthorn, and has the property of sometimes flowering in December. Dr Maton says, "I have never seen the Glastonbury Thorn in fructification, but all the botanists who have examined it in that state, agree that it is no other than the common *Cratægus monogyna.* It is a fact, however, that the shrub here flowers two or three months before the ordinary time, and sometimes as early as Christmas-day, O.S., whence I conjecture it must be at least a *variety* of the above species, which may have been introduced originally by some pilgrim or other from the east."

An intelligent correspondent of the *Gardener's Magazine* thus writes on this subject:—"The unsatisfactory, and even contradictory, statements which occur in various works, both on systematic botany and on horticulture, respecting the Glastonbury Thorn, induce me to trouble you with this communication. Not that I consider myself able to give you full and satisfactory information on the subject, but I hope, at least to be enabled, from very long residence in the neighbourhood, to describe with accuracy whatever is known with certainty at Glastonbury about the plant in question. The popish legend about the staff of Joseph of Arimathea, I may be permitted to pass over in silence, and, therefore, come at once to the thorn-tree now standing within the precincts of the ancient abbey of Glastonbury; for there can be no doubt, that from this tree and its forefathers, (the present one being of great age,) all others of the kind had been propagated by budding or grafting. The most remarkable peculiarity of this tree, and in those descended from the same stock, is the time of flowering: it is now (December 31, 1832,) in blossom, and I transmit you a specimen for examination; it will again blossom in the month of May, and from these latter flowers fruit will be produced."

The parish of Glastonbury, which is divided into the two parishes of Glastonbury-St-Benedict, and Glastonbury-St-John, in the county of Somersetshire, contained in 1841, a population of 3314.

GLIADINE; the adhesive, elastic principle of gluten and birdlime, a substance found in all kinds of grain and leguminous seeds. It is very prone to fermentation, and when undergoing that change causes fermentescible fluids to ferment. It is the chief ingredient of yeast or ferment.

GLOUCESTERSHIRE; an inland county of England, bounded on the north-west by Herefordshire, on the east by Oxfordshire and a small part of Berkshire, on the south by Wiltshire and Somersetshire, and on the west by part of the latter county, the Bristol channel and Monmouthshire.

It is about seventy miles in length, forty in breadth, and 156 in circumference. Through a great portion of its length it is divided into two unequal parts by the river Severn. Its other chief rivers are the Wye, the Frome or Shroud, and the two Avons. The city of Gloucester is 102 miles north-west of London. From the several rivers above named, together with some others of less note, this country is rendered one of the richest, most fertile, and delightful parts of England.

This county is naturally divided into three distinct parts or tracts—the eastern, the middle, and the western; which have received the several names of *The Vale*, *Catswold*, and the *Forest of Dean*. The *Vale of Gloucester* manifestly derives its name from its situation; and the *forest* was probably called the "*Forest of Dean*" from the principal town in the district. Some, however, have supposed the word *Dean* to be a corruption of *Arden*, a name used by both the ancient Gauls and Britons to signify a *wood*. The eastern part, which is the widest of the three, is called the *Catswold:* the chief part of this tract is barren and moorlike, but affords excellent pasture for sheep, famous for their superior fleece, which has rendered this a celebrated clothing county. Originally, the sheep of this county were very small, but of late the breed, however, has been greatly improved by the introduction among it of sheep from other counties. The middle tract, called the *Vale*, is well watered by the Severn, and from its joining the Vale of Evesham, it is sometimes known by that name. The western part of Gloucestershire is a perpetual alternation of hills and small vales, which formerly was every where clothed with timber, which furnished the principal supplies for our navy. Much of this timber is now cut down, but the tract, even yet, is more of a forest than an agricultural district.

The chief natural productions of this county are iron and coal, of which it furnishes large quantities. Its chief manufactured products are woollen goods of various kinds, and cheese, for which it is very eminent.* It is likewise noted for perry and cider.

Gloucestershire is in the province of Canterbury and diocess of Gloucester, and is included in the Oxford circuit. The county is divided into twenty-eight hundreds, containing two cities (Bristol and Gloucester), one county town (Gloucester), twenty-eight market towns, three hundred and forty parishes and six parts of parishes.

Gloucestershire, before the Reformation, contained four of the great mitred abbeys, Gloucester, Tewkesbury, Winchcomb, and Cirencester, besides several smaller convents. The twenty-eight hundreds are Barton Regis, Berkeley, Bisley, Blidesloe, Botloe, Bradley, St Briavels, Brightwells Barrow, Cheltenham, Cleeve, Crowthorne and Minety, Deerhurst, Dudstone and King's Barton, Grumbald's Ash, Henbury, Kiftsgate, Duchy of Lancaster, Langley and Swineshead, Longtree, Pucklechurch, Rapsgate, Slaughter, Tewkesbury, Thornbury, Tibaldstone, Westbury, Westminster, and Whitstone. Besides Bristol, partly in Somersetshire, and Gloucester, its capital, the county contains the boroughs of Cirencester and Tewkesbury; and the market-towns of Berkeley, Bisley, Blakeney, Campden, Cheltenham, Colford, Dursley, Fairford, Lechlade, Marshfield, Micheldean, Minchinhampton, Moreton, Newent, Newnham, Northleach, Painswick, Sodbury, Leonard Stanley, Stow-on-the-Wold, Stroud, Tetbury, Thornbury, Wickwar, Winchcomb, and Wotton Underedge;

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* *Gloucester Cheese.*—In the preparation of this cheese, the milk is, in the first instance, put into a cheese-cowl (which is a large deep tub) with two teacupsful of rennet. A ball of annatto is then dipped in the milk and rubbed on a piece of pantile, which is washed into the milk till the colour is as high as required. The quantity of annatto is regulated by the wishes of the cheesefactor, some liking more than others. Originally only a small quantity was employed, to induce the belief that the cheese was rich, and to prevent its being discovered that skimmed milk had been used. But now almost all the cheese is highly coloured; and the colour is no criterion of the goodness of the article. After an hour has elapsed, the milk is converted into curd; this is cut with a cheese-knife, which is about fourteen inches in length, and has two edges: it is cut gently at first, and then very small. It is suffered to remain ten minutes, when the milkmaid puts her arms into the cowl and draws the curd gently towards her, turning it over in the whey. She afterwards again draws it towards her to dip out the whey, which is strained through a sieve, and the small pieces of curd that are strained from it are returned to the cowl. The curd is then put into vats, in which cloth had been previously laid. The vats are placed one on another, and put in a cheese-press for ten minutes, a vessel having previously been placed underneath the press to catch the expressed whey. After this, the curd is taken out of the vats and broken small, and some hot whey is poured over it. The curd is then drawn to the side of the cowl to drain from the whey, which is ladled off and strained so that no curd may be wasted. Then the curd is again put into the vats, and they are pressed one on another; any curd that is pressed over the edges of the vats being put in the middle of the vats to make the mass as firm as possible. In an hour the vats are taken out of the press to have dry cloths, after which they remain in the press till night, when the compressed curd is taken out of the vats, turned and salted, and then replaced in the press, and there remains till morning, when it is salted, and also again the following evening. The second morning the cloths are taken off, but the cheeses are left in the vats seven or eight days, being turned night and morning. After that, they are put on the floor of the cheese-loft, (which is a large room on purpose for keeping cheese,) and turned every day for three weeks or a month. In two months the cheeses are scraped and painted. The paint is a red powder, which is strewed over the cheeses and rubbed on them with the hand. In three months they are what is technically called "ready," and are fit for the cheese-factor.

The whey that drained from the curd, during the process of cheesemaking, is put into trendles (a sort of tub) and suffered to remain till the next day, when it is skimmed. From this whey butter is made, and the residue is given to pigs. The rennet is made by mixing salt and water till it will support an egg, and then boiling it half an hour. When it is cold, four calves' stomachs are put to a gallon of the brine, with bay leaves and slices of lemon. In six weeks it is fit for use.

For single Gloucester cheese, the vats, which are made of elm, are thirteen inches in diameter, and about two inches and a half in depth: for double Gloucester cheese. the same diameter, and twice, or more than twice the depth. All the dairy-utensils, after being used are washed with tepid water, and then scalded. In making the double Gloucester cheese, and those that are called "truckles," the same method is pursued, except that more care is used in pressing the curd into the vats, which, for such cheeses, have three perforations to let the whey drain off; and bandages of cheese-cloth are put round when the curd is above the vat. Sage-cheese is made by pounding sage and straining the juice into a pail of milk, to which rennet is then added. The same process is observed as for other cheese till the time when the warm whey should be poured upon it, when it is broken up with as much of the simple curd as the milkmaid considers necessary, and treated as other cheese. To make the richest cream-cheeses, the thickest cream must be taken, and put, with a little salt, into a straining-cloth, which is hung up twelve hours in order that the whey may drop from it. When it is taken from the cloth, it is put between two pewter-plates, with a weight on the upper one, and turned daily during five or six days. These cheeses can only be made in this manner in warm weather. The milk that the cows give when they are first turned into the fields in the spring, and when they are afterwards pastured in fields that have been newly mown, yields nearly as much curd again as at any other period; and it is also much richer. The principal season for making the thin cheese is from April to November: and that for making the thick, May, June, and the beginning of July. In different districts, the produce of cows differs very much; but, in the Vale of Gloucester, from 3½ cwt. to 4½ cwt. per cow is considered a fair annual average return. The same cow, on different pastures, will yield milk of very different qualities; from one will be made rank and unpleasant cheese, while the other will be fine and rich.

but the markets of Bisley, Blakeney, and Leonard Stanley are disused.

Previous to the passing of the Reform bill the county returned ten members to parliament, namely, two each for the cities of Gloucester and Bristol, two each for Cirencester and Tewkesbury, and two for the shire, which latter, by the provisions of the new act, now returns four; and the elective franchise having been conferred upon Cheltenham, with the privilege of electing one burgess, and upon Stroud, which sends two, the number of representatives is thereby increased from ten to fifteen. The county is divided into two representative districts, called the eastern division and the western division: the return of members for the former is made from Gloucester, and for the latter from Dursley.

The canals that pass through Gloucestershire are distinguished by the names of the Thames and Severn, the Stroudwater, the Berkeley, and the Hereford and Gloucester. The Stroudwater begins at the town of Stroud, and entering the Severn at Framilode. Its width is 42 feet, its length nearly 8 miles, and its rise above the Severn 102 feet. It was constructed in 1775. The Thames and Severn canal begins at Walbridge, where the Stroud navigation ends, and joins the Thames at Lechlade. Its general breadth is 40 feet, its length 28 miles, and its fall to the Thames 130 feet. It is carried through Sapperton-hill by a tunnel two miles and three furlongs in length, and was opened in 1789. The Hereford and Gloucester canal begins at Hertford, and joins the Severn opposite Gloucester. Its length is thirty-five miles. The Berkeley canal, intended to open a safer and shorter passage for vessels of large burden between Gloucester and the wider part of the Severn, was begun in 1794 and finished in 1827, at an expense of half a million of money. It extends about eighteen miles in length, is from seventy to ninety feet wide, and eighteen feet deep. It runs on a dead level the whole way.

The railways are the Bristol and Exeter, which may be considered a continuation of the Great Western railway, commences at the former city, and taking the route of Bridgwater, runs near the towns of Taunton and Wellington, through Cullompton to Exeter. The western union proceeds from Gloucester, and, passing a short distance to the west of Cirencester, joins the Great Western railway near Swindon, in Wiltshire. The projected Bristol and Gloucester will form a communication between the two cities; and above the town of Stroud will join the western union. The Birmingham and Gloucester railway, in its route from Gloucester, visits Cheltenham, and runs a little to the east of Tewkesbury; then, leaving Worcester about four miles to the left or west, passes near Droitwich and Bromsgrove to Birmingham—from whence proceeds the Grand Junction to Manchester and Liverpool, and the Birmingham and London to the metropolis.

Gloucestershire contains a large population. In 1841 it amounted to 431,383, being 205,543 males, and 225,840 females.

GLYCERINE; the sweet principle of oils. When oil is converted into soap by the action of an alkali, the glycerine is separated, and dissolved in the water on which the soap floats. It has lately been shown by Chevreul, Liebeg, and Pelouze, that all saponifiable oils and fats are compounds of fatty acids with glycerine. In saponification, the former combine with the alkali while the latter is set free. It forms, when pure, a syrup, which does not crystallize.

GODWIN-SANDS; a range of sandbanks in the sea, extending about three leagues along the coast of Kent, in the neighbourhood of Deal. They were formed by an eruption of the sea in the year 1100, which swallowed the lands of Earl Godwin, extending to upwards of four thousand acres. They are extremely dangerous, especially to vessels riding in the downs, which are often driven upon them by violent winds, though by breaking the waves that would otherwise roll in upon the shore with immense impetuosity they contribute greatly to the safety of that famous roadstead. They are divided by a very narrow channel into two parts, and are in many places dry at low water. Their position, however, is often shifted by the force of the tides aided by violent storms. Floating lights are placed off them, and in hazy weather a bell is kept constantly ringing to warn the approaching mariner of his danger.

GODWIN, William, a celebrated novelist and political writer, was born at Wisbeach, in Cambridgeshire, the 3d of March, 1756. His father was a clergyman. In 1760 the father removed with his family to a village about sixteen miles north of Norwich, where he presided over a congregation. In 1767 William was placed with a private tutor at Norwich, for the purposes of classical education, and in 1773 he entered a college for dissenters at Hoxton, for the purpose of being educated for the church. Dr Kippis and Dr Rees were two of the principal professors at this college; and the tenets in vogue there inclined to Unitarianism. Mr Godwin had been bred a Calvinist, and was the farthest in the world from that temper of mind which is blown about by every new wind of opinion. Opposition made him more tenaciously cling to his own turn of thinking, and adhere to the persuasion in which he had been brought up. In the year 1778 he became minister to a congregation not far from the metropolis. He continued in the exercise of the duties of a clergyman for five years; after which he gave it up, in the year 1783, and came to reside in London; where he became soon distinguished as an author among his contemporaries, and frequented the society of many of the political leaders of the day, among whom Fox and Sheridan held the first rank. The French revolution, which broke out in 1789, when he was already engaged in his career as an author, turned his attention still more definitely to political subjects. The result of his meditations and his labours was "Political Justice," published early in the year 1793. At once the book and its author rose to a place of eminence in the public eye. Early in the following year he published "Caleb Williams" a novel which, in despite of the brilliant works of the same species which have since adorned our literature, still holds its place. In 1797 he published "The Enquirer," a work consisting of essays, developing, under various aspects, the tenets of his greater work. In the beginning of the same year he married the celebrated Mary Wollstonecraft, (see *Godwin, Mary*, in body of work,) but was not allowed long to enjoy the happiness he reaped from this union. She died the 10th of September 1797, having given birth to a daughter, the present Mrs Shelley.

The next work of Mr Godwin was the romance of "St Leon," published in 1799. The domestic happiness he had enjoyed, colours and adorns the scenes of this book. In 1800 he visited Ireland. He resided while there principally with Curran, and associated intimately with Grattan, and all the other illustrious Irish patriots. In 1801 he again married a widow lady of considerable personal attractions and accomplishments. The sole offspring of this marriage was a son, born in 1803. In the same year he published the "Life of Chaucer;" a work presenting a correct and animated picture of the times of the poet. This was followed in 1804 by a third novel, entitled "Fleetwood," characterised by elegance of style and force of passion, less striking perhaps than his former works of imagination, yet not less full of beauty and interest. In 1808, he published an "Essay on Sepulchres." In 1816 he visited Edinburgh, where he formed an acquaintance with Walter Scott and other celebrated Scottish writers; and here also he entered into a treaty with Mr Constable, the bookseller, for the composition of a new novel. "Mandeville," published in 1817, was the result. We here trace the mellowness of ripened years; the reading, the study, the careful polish of maturity, adorning, but not diminishing, the untamed energy and eloquence of his earlier works. In 1820 his work in opposition to the opinions of Malthus appeared. Fervently attached to all that is lofty, independent, and elevating in his speculations on human society, Godwin strenuously controverted the degrading, hard, and demoralizing tenets of the author of the Essay on Population. After this, he was occupied several years in writing "The History of the Commonwealth of England." The four volumes of which this work is composed were published in the years 1824, 1826, 1827, and 1828. In 1830 he published "Cloudesley," his last novel.

In addition to the above works Mr Godwin published, in 1784, a series of six sermons, called, "Sketches of History." Soon after, he was engaged as a principal conductor of the "New Annual Register," a situation from which he derived a small but certain income. The year after the death of his first wife, he published a life of her, under the title of "Memoirs of Mary Wollstonecraft." He also edited her posthumous works. In 1800, a tragedy of Mr Godwin's called "Antonio, or the Soldier's Return," was brought out at Drury Lane Theatre; but was performed only one night. In 1801 appeared "Thoughts on Dr Parr's Spital Sermon," being a reply to some attacks which had been made upon him by Dr Parr, Sir James Mackintosh, and others. After the publication of his "Fleetwood," (in 1804), Mr Godwin was for some time little to be seen or heard of in general society. He had, as it were, departed from the busy and the bustling scene of life. He was, however, still in London; and in one of its most populous parts, Skinner Street; had opened a bookseller's shop, where, under the assumed name of Edward Baldwin, he was peaceably ushering forth little works for the instruction and entertainment of young people: many of these were written by himself, under the name already mentioned, and bear the following titles: "Pantheon, or the History of the Gods of Greece and Rome;" "A History of England;" "Outlines of English History, for very young Children;" "History of Rome;" "History of Greece;" "Outlines of English Grammar; and Fables, Ancient and Modern;" &c. These little books are still on sale, and some of them have passed through several editions. In this employment Mr Godwin lived for many years, unknown but to his friends, in straitened circumstances, yet too proud to own it. In 1807 he made another unfortunate dramatic attempt in producing "Faulkner," a tragedy, at Drury Lane Theatre. In 1815 appeared "The Lives of Edward and John Philips," Milton's nephews and pupils. This work is written in a pleasing style, and is a valuable acquisition to literary history. Mr Godwin also communicated some letters to the Morning Chronicle newspaper, under the signature Edax, "on the assumed grounds of the War," which were collected and republished in the same year. His last work, "The Necromancers," appeared in 1834. From an interesting and valuable catalogue of Mr Upcott's MS. treasures, it appears, that he received for his great work on "Political Justice," £700; for "Caleb Williams," £84; and for "St Leon," 400 guineas. This is a curious illustration to his history, showing the comparative consequence of Godwin's name at different periods of his life.

In person, Mr Godwin was rather under the middle stature, and compactly built; his countenance was of a particularly mild and pleasing cast, and when not excited, few would believe him to be the violent politician and astounding novelist who could make thousands tremble at his name. He always enjoyed good health, which may be considered a reason that the power and faculties of his mind were preserved so fully and so clearly to the last; he could not have been happy had he laid aside his pen, nor would he willingly have deprived his fellow-creatures of what he himself considered to be the advantages arising from his labours. His last few years were rendered comfortable to him by an appointment, which he received during the administration of Earl Grey, to the sinecure office of Yeoman Usher of the Exchequer. He resided latterly in the residence attached to this office adjoining the speaker's gateway in New Palace Yard, and which was pulled down in 1837. The death of Mr Goodwin took place on the 7th of April, 1836.

Mr Godwin's son, William, died Sept. 8, 1832, of cholera, after a very short illness, in the 29th year of his age. He had been connected for some years with the press, and was one of the parliamentary reporters of the Morning Chronicle. He possessed, as a writer, much of the literary power of his family. His Essays, in the periodicals, to which he contributed, were marked by more than ordinary liveliness and good tact, and showed at the same time an extent of observation much beyond what could have been expected from his years and experience.

GOLD-FISH, (*a.*) OR **GOLD-CARP**, (*Cyprenus Auratus,*) were first introduced into this country from China, about the year 1691, but were not generally known till 1728, when a great number were presented to Sir Matthew Dekker, and have gradually been distributed to most parts of the country. They breed in ponds and small portions of water, but are not to be found in any of our rivers. A flow of water, even through a pond, is almost sure of destroying them, the water, by such a change, proving too cold for them: but in stagnant water, and even in fetid ditches, they appear to do well. Their spawning time in England varies according to the season, being seldom earlier than May, or later than July, and, under very favourable circumstances, they will spawn even more than once in the year. The approach of this season is known, as with other fish, by their following each other with very quickened motion, so much so, that they will sometimes jump out of the water, or thrust themselves into weeds so near the bank as to allow themselves to be taken by the hand. The milters, or male fish, are not distinguishable from the spawners, or females, by any difference of colour, as many have supposed, but are known by the dorsal fin, which in the male fish is short, and ends abruptly; but in the female it is long, extending almost to the tail, and is of a fan-like shape. The actual time of spawning may be perceived by an unusual stillness in the fish, and by their keeping in deep water, even in the hottest weather, contrary to their usual practice, which is, to remain basking in the sun at the very surface, and with their backs frequently out of the water. The increase of these fish, when first put into a pond, will be very considerable, but after a time, unless the young fry are removed, there is little or no increase; this arises, no doubt, from their eating the spawn before it has life. In the Chinese rivers the spawn is carefully collected, and exposed for sale, and a great number of barks may be seen on the great river Yangtse-kiang, which go thither to purchase it. When the spawn becomes alive, the fish are of a very dark colour, many of them nearly black, and others of a dark slate colour. The former of these produce the red or gold-fish, and the latter the white or silver fish. The time at which this change takes place is very various. In some it happens at the end of the first year, but in others not till the second or third year, or even perhaps later. Our observations do not enable us to give any general rule on this subject. Although these fish are extremely tender, yet they are seldom affected by our coldest winters, and seem in the spring to have been not at all altered by the winter months. The heat, however, of the hand, is sufficient to deprive them of life, and is probably one reason why they seldom live long when confined in glasses. Persons who are desirous of keeping them should change the water very frequently, and remove the fish by a small landing-net. It is also of advantage to keep them during the night in a pail or tub of water, and remove them into the more confined place in the morning. The best time of the year to take them from the pond is during the month of April, or before they become heavy with spawn; for in a state of confinement they seldom or never survive the spawning season. They never spawn in a transparent vessel. The colours also of these elegant and beautiful fish vary considerably at different seasons; but we have always noticed that the colours are the most brilliant about the time of spawn. When kept in ponds they may be made very familiar. By occasionally feeding them with bread they become tame, and will generally begin to congregate on hearing the sound of the human voice. It is not at all unusual for them to be brought together at the sound of a whistle, or other shrill noise. But if any attempt is made to catch them, either by hook or net, they become extremely shy, and it is not until after a considerable time that they again become familiar.

GOODWIN, Francis, an English architect of some eminence, who died in London, Aug. 30, 1835. The public works of this gentleman were new churches at Hulme, by Manchester; Ashton under Lyne: Portsea, Hants; Derby; Kidderminster; Oldham; Bordesley, by Birmingham; West Bromwich; Bilston; Walsall; and Burton upon Trent. He rebuilt churches at Bilston and Walsall; St Michael's, Southampton; the tower of St Peter's, Manchester; and the tower and spire of St Paul's, Birmingham. He also erected town halls at Manchester and Macclesfield, markets at Leeds and Salford, an exchange at Bradford, and a county prison at Derby. A description of the Manchester town hall, which may be termed his chef-d'œuvre, is given in the Introduction to his second volume of "Rural Architecture," with an interior view and plan. His principal private work was Lissadell, the mansion of Sir R. G. Booth, bart., in Co., Sligo, an interior of the gallery in which forms the frontispiece to his first volume of "Rural Architecture." He was also employed by lord Hatherton, in Staffordshire; by E. J. Cooper, Esq. M. P. at Markree, Co., Sligo, &c. When public buildings were offered to competition, Mr Goodwin frequently furnished plans, and in several instances he obtained premiums. This was the case with regard to the new grammar school of Birmingham, his design for which was exhibited in 1834 at Somerset house. A few years ago he brought before the public a scheme for an extensive cemetry in the vicinity of the metropolis, the drawings of which were exhibited at an office taken expressly for the purpose in Parliament Street. The grounds were to have been ornamented with a variety of edifices, copied from the principal buildings at Athens, of some of which there would have been duplicates in the corresponding parts of the inclosure. This project excited some attention at first, but soon died away; and, in fact, it was upon such a scale that it could hardly have been realised. During a great part of 1834, Mr Goodwin was in Ireland, preparing designs for extensive additions to the college at Belfast, including a magnificent building for a museum, the plan of which was ingenious and novel; and he was also engaged in planning some baths at Dublin: but both these undertakings seem to have been abandoned. The proposals put forth for designs for the new houses of parliament engrossed his attention more deeply than any previous object, as he felt anxious to avail himself of the advantage which his previous attention to the same subject, two years before, had already afforded him. At the inquest which was held on his death, Dr Copeland said that the deceased had for some months past been engaged in forming plans for the erection of the houses of parliament; and so intense had been his studies upon the occasion, that he declared to him (the doctor) that he was unable to obtain any rest at nights, so completely engrossed were his thoughts upon the plans he was engaged in drawing out. In answer to a question from the coroner, the doctor said that such intense study was likely to produce a determination of blood to the brain, and occasion an attack of apoplexy. The jury returned a verdict of "died by the visitation of God, in a fit of apoplexy." Mr Goodwin was the author of a work entitled "Rural Architecture: a series of Designs for Rustic, Peasants', and Ornamental Cottages, Lodges, and Villas, in various styles," in two volumes, quarto, each of which has a supplement, entitled "Cottage Architecture." He also published, in 1833, his "Plans of a new House of Commons."

GOOSEBERRY, (*a*.) The gooseberry is only to be found in temperate climates, being unknown between the tropics of either hemisphere. It may be considered to be one of the native fruits of this island, and it is known to have been an object of cultivation so far back as the reign of Henry VIII. Only about a dozen varieties were then known; now several hundreds can be enumerated.

The gooseberry in the southern parts of England is not comparable to that of the north; and the flavour of the Scotch berry is much superior to that of those produced in any part of England; while, in Scotland itself, the gooseberries of Dundee, Aberdeen, and Inverness, much exceed in flavour any which the Edinburgh market-gardeners can raise. In size and appearance, however, the gooseberries of Lancashire are, perhaps, unequalled by any in the world; and there, and in the counties of Cheshire, Staffordshire, and Warwickshire, the striking improvement which has taken place in the cultivation of this cheap and agreeable fruit is to be attributed less to the market-gardeners, or even to the scientific horticulturists, than to the mechanics, who very generally spend much of their leisure time in the pleasing occupation of gardening, particularly in the cultivation of the gooseberry, and have their ambition very much turned towards the production of large specimens of that fruit. Some idea of the attention which has been paid to this object may be formed from the fact, that of the two hundred kinds of gooseberries which are enumerated in the fruit catalogue of the horticultural society, not fewer than a hundred and fifty are the large Lancashire gooseberries. "Gooseberry shows," as they are called, are periodically held in different parts of Yorkshire, Lancashire, and Cheshire, at which berries are exhibited in competition for prizes. This operates as a stimulus to the cultivation of the fruit.

About forty years since it was thought a great thing when an amateur grower pulled a gooseberry that was heavier than a "spade-ace guinea," or, in the parlance of the workshop, "weighed more than a pound." Berries were, however, soon after produced that weighed twice as much; and little would now be thought of a show fruit that should not weigh five "pounds," or sovereigns. The largest gooseberry ever grown was a handsome yellow fruit called "Teazer," which was shown at Stockport in July, 1830, and weighed 32 dwts. 13 grs. The heaviest red berry on record was the "Roaring Lion," exhibited at Nantwich in 1825, and weighing 31 dwts. 16 grs. The heaviest white was the "Ostrich,"—24 dwts. 20 grs.—shown at Ormskirk in 1832, in which year the maximum of reds was only 27 dwts. 13 grs. In the same season, a seedling green was exhibited at Nantwich of the uncommon weight of 30 dwts. 18 grs. To this statement of the weight to which the fruit has sometimes been brought, it may be interesting to add that a seedling plant of reputation has been known to produce, when sold in lots, upwards of £32. This was a rare case, indeed; but it is said to be not at all unusual for twenty guineas to be brought in by the distribution of a single bush in rooted parcels.

GRANT, Sir William, The Right Hon., formerly master of the rolls, was descended from the Grants of Beldornie, one of the branches of that great and ancient clan of Grants which has been so long distinguished in the history of Scotland. His father, who was originally bred to agricultural pursuits, died collector of customs in the isle of Man. He was himself born in the year 1754, at Elchies, on the banks of the Spey, in the county of Moray; and was placed with his younger brother (who became collector at Martinico) at the grammar school of Elgin. He completed his education at the old college of Aberdeen; and then repaired to London, to pursue the study of the law. He was entered at Lincoln's inn; and at the age of twenty-five, he was considered competent to fill the situation of attorney-general of Canada, to which he was accordingly appointed. He immediately left this country for that colony, not having been then called to the bar. He soon obtained undisputed pre-eminence at the Canadian bar; all his talents were called into active service; and he showed that, if occasion wanted, he could engage in other duties than those of his profession. Canada was at that time traversed in every direction by the rebellious armies of America, and Mr Grant was present at the memorable conclusion of their attempt—the siege of Quebec, and the death of Montgomery. Mr Grant himself engaged in active military duty, and commanded a body of volunteers. He remained in Canada for a considerable period, enjoying all the success which could there be obtained; but the state of the colony could not have been very inviting. Probably the disturbance which his favourite pursuits met, and the opinion that he had abilities greater than were necessary for pre-eminence at a colonial bar, induced him to resign his office of attorney-general, and to try his fortune in England. Certain it is, that he returned to this country, and was called to the bar by the society of Lincoln's inn, in the year 1787. Mr Grant took his stand in the common law courts, and joined the home circuit. The usual fate, however, here awaited him. Nearly unknown in this country, entirely without the necessary connection to insure an early introduction to business, and being naturally of rather a shy and retired turn, he went the circuit for several years without obtaining a single brief. How long he might have remained thus unemployed it is in vain to conjecture. But, happening to be retained in some appeals from the court of session in Scotland to the House of Lords lord chancellor Thurlow was much struck with his powers of argument, and having learned his name, observed to a friend, "Be not surprised if that young man should one day occupy this seat." That this prophetic opinion was not fulfilled to the letter, has been generally attributed to Sir William Grant's refusal to undertake the duties attached to that high office. In consequence, however, of an invitation from lord Thurlow, he subsequently left the common law bar, and thenceforward practised solely in equity. At the general election in 1790, Mr Grant was returned for Shaftesbury, and soon distinguished himself as a powerful coadjutor of Mr Pitt. He spoke seldom, and never but on questions with which he was fully acquainted; but his talents and information were soon so generally recognised, as to render his assistance essentially valuable. He was called within the bar, with a patent of precedence, in 1793; and in the same year was appointed a Welsh Judge, when a new writ was ordered for Shaftesbury on the 20th of June, and he was not re-chosen. However, on a vacancy for Windsor, which occurred in the following January, he was elected for that borough: he was at that time solicitor-general to the Queen. In 1796, he was chosen knight in parliament for the county of Banff.

In 1798, he was appointed chief justice of Chester; in 1799, he succeeded the late lord Redesdale as solicitor-general, and was of course knighted; and on the 20th of May 1801, in consequence of the promotion of Sir Pepper Arden to be chief justice of the common pleas, he was nominated master of the rolls. During the whole of this period, he continued to render essential service to Mr Pitt and his administration in the House of Commons; remaining member for Banff until the dissolution of 1812. As a politician, however, no personality disgraced his attacks, no venom embittered his arguments. During a period of upwards of sixteen years he filled the judicial chair in the rolls court with undiminished credit. At length he became anxious to retire while still in the full possession of his faculties. This purpose he carried into effect in the latter end of 1817, from which period he appeared little in public life.

During his latter years he lived chiefly at Barton house, Dawlish, the residence of his sister, the widow of admiral Schanck; and at that place he died, on the 25th of May, 1832. He never married.

The late Mr Charles Butler, in his "Reminiscences," speaks of Sir William Grant in the following terms:—"The most perfect model of judicial eloquence which has come under the observation of the Reminiscent, is that of Sir William Grant. In hearing him, it was impossible not to think of the character given of Menelaus by Homer, or rather by Pope,—that

'He spoke no more than just the thing he ought.'

But Sir William *did* much more:—in decompounding and analysing an immense mass of confused and contradictory matter, and forming clear and unquestionable results, the sight of his mind was infinite. His exposition of facts, and of the consequences deducible from them, his discussion of former decisions, and showing their legitimate weight and authority, and their real bearings upon the point in question, were above praise; but the whole was done with such admirable ease and simplicity, that while real judges felt its supreme excellence, the herd of learners believed that they should have done the same. Never was the merit of Dr Johnson's definition of a perfect style,—'proper words and proper places,'—more sensibly felt than it was by those who listened to Sir William Grant. The charm of it was indescribable; its effect on the hearers was that which Milton describes, when he paints Adam listening to the angel after the angel had ceased to speak; often and often has the Reminiscent beheld the bar listening, at the close of a judgment given by Sir William, with the same feeling of admiration at what they had heard, and the same regret that it was heard no more."

GRANT, Mrs, of Laggan, was born at Glasgow in the year 1755. Her father, Mr M'Vicar, was an officer in the British army, and on her mother's side she was descended from the ancient family of Stewart of Invernahyle, in Argyllshire. Shortly after her birth, her father accompanied his regiment to America, under the auspices of the earl of Eglinton, with the intention of settling there, if he should find sufficient inducement for doing so. His wife and infant daughter soon after joined him. They landed at Charleston, and though the child was then scarcely three years of age, she retained ever after a distinct recollection of her arrival in America. During her residence in that country, she was taught by her mother to read, and she never had any other instructor. But she was so apt and diligent a scholar, that before her sixth year she had perused the Old Testament, with the contents of which she was well acquainted. About the same age she also learned to speak the Dutch language, in consequence of being domesticated, for some time, with a family of Dutch colonists in the state of New York. Soon after, the sergeant of a Scottish regiment gave her the only lessons in penmanship she ever received; and observing her love of reading, he presented her with a copy of Blind Harry's "Wallace," which, by his assistance, she was enabled to decypher so fully as not only to understand the dialect in which the book was written, but also to admire the heroism of Wallace and his compatriots, and to glow with that enthusiasm for Scotland, which, as she herself expressed, ever after remained with her, as a principle of life. Her fondness for reading was universally observed, and fortunately procured for her, from an officer of her father's regiment, a copy of Milton's Paradise Lost, which, young as she was, she studied with much care, and which she afterwards found to be an inestimable treasure. To the diligent study of this book, Mrs Grant herself ascribed the formation of her character and taste, observing that whatever she had of elevation of spirit, expansion of mind, or taste for the sublime and beautiful, she owed it all to her familiarity with Milton. The effect of this became so evident in her conversation and habits, as soon to secure for her the notice of several of the most eminent settlers in the state of New York, and in particular to procure for her the friendship of the celebrated Madame Schuyler, whose worth and virtues Mrs Grant has extolled in her "Memoirs of an American Lady." Mrs Grant's father had, with the view of permanently settling in America, received a large grant of land, to which, by purchase, he made several valuable additions; but falling into bad health, he was advised to leave America, which he did very hurriedly, and without having got his property disposed of. He returned with his wife and daughter to Scotland about the year 1768, and a few years afterwards he was appointed Barrack-Master of Fort-Augustus. Soon after this the Revolutionary war broke out in America, and before his landed property there could be disposed of, it was confiscated, and thus the chief means to which the family had to look for their support were cut off. While her father was Barrack-Master at Fort-Augustus, the office of chaplain to the Fort was filled by the Rev. James Grant, a young clergyman of accomplished mind and manners, and connected with some of the most respectable families in the neighbourhood. Mr Grant was soon afterwards appointed minister of the parish of Laggan, in Invernesshire, and in the year 1779 he was united in marriage to the subject of this notice. Of this marriage twelve children were born, four of whom died in comparatively early years, and soon afterwards Mr Grant himself was cut off, in 1801, leaving his widow with a family of eight surviving children.

Mrs Grant had always found delight in the pursuits of literature, and having early shown a taste for poetry, she was occasionally accustomed, for the entertainment of her friends, to write verses; and she also, by way of relaxation, carried on an extensive correspondence with some of the friends of her youth. Of her poems, which were generally written with much haste, and on the spur of the moment, her friends formed a much higher opinion than she herself ever did. She generally gave them away, when they were finished, without retaining any copy. It occurred to some of those friends that a volume of her poems might be published with advantage; and, before she was well aware of their kind intentions, proposals were dispersed all over Scotland for publishing such a volume by subscription. At this time, Mrs Grant had not even collected the materials for the proposed publication; but in a short period, the extraordinary number of upwards of 3000 subscribers had been procured by her influential friends. The late celebrated duchess of Gordon took a lively interest in this publication; and Mrs Grant was, in this way, almost forced before the public. The poems were well received on their appearance in 1803. From the profits of this publication, Mrs Grant was enabled to discharge all the debts which had hitherto pressed upon her, and which had been contracted during her married life. Three years after this, she published her well-known "Letters from the Mountains." They went through several editions, and soon raised Mrs Grant into much deserved popularity, and procured for her the patronage and friendship of many influential individuals, and particularly of the late bishop Porteous, Sir Walter Farquhar, Sir William Grant, and many other eminent persons.

In the year 1810, Mrs Grant removed from Stirling to Edinburgh, where she resided during the remainder of her life. Here it was her misfortune to lose successively all her remaining children, with the exception of her youngest son. The only other works of any magnitude which Mrs Grant prepared for the press, were her "Memoirs of an American Lady," already referred to, and her "Essays on the Superstitions of the Highlanders of Scotland," both of which were favourably received. The former work has been greatly esteemed both in this country and in America, and contains much vigorous and powerful writing, with sketches of Transatlantic scenery and habits, during a primitive period, which were characterised as "a picture of colonial manners, just in their happiest age, given with a truth and feeling that cannot be too highly estimated."

In 1825, Mrs Grant received a pension of £100 yearly on the civil establishment of Scotland, which, with the emoluments of her literary works, and some liberal bequests by deceased friends which subsequently arose, rendered her latter years quite easy and independent. Her conversational powers were, perhaps, still more attractive than her writings. Her information on every subject, combined with her uniform cheerfulness and equanimity, made her society very delightful. There was a dignity and sedateness, united with considerable sprightliness and vivacity, in her conversation, which rendered it highly interesting; and withal, it was so unaffected and natural, and seemed to emanate from her well-stored mind with so little effort, that some of her most profound and judicious remarks, as well as her liveliest sallies, appeared as if they had been struck off at the moment, without any previous reflection. The native simplicity of her mind, and an entire freedom from attempts at display, soon made the youngest person, with whom she conversed, feel in the presence of a friend; and if there was any quality of her well-balanced mind which stood out more prominently than another, it was that benevolence which made her invariably study the comfort of every person who came in contact with her. She died on the 7th Nov. 1838, aged eighty-four.

GREECE, (*a.*) In January 1833, the allied powers elected Otho, the second son of the king of Bavaria, then a minor, king of Greece (the crown having been previously refused by prince Leopold of Saxe-Coburg), and in February, he arrived in Greece, accompanied by a council of regency, and was acknowledged by the Greeks as their sovereign. In June, 1835, Otho, being of age, took the direction of the affairs of state, and in Nov. 1836, he married a daughter of the grand-duke of Oldenburg. It is settled, that the children by his marriage with the princess of Oldenburg shall be educated in the Greek church. The government is a constitutional hereditary monarchy, with two legislative houses, a senate and a house of representatives.

Divisions.	Pop.	Towns.
Northern Greece, or Livadia,	206,000	Athens, 15,000.
Peloponnesus, or Morea,	429,000	Nauplia, Patras.
The Islands, or Cyclades,	176,000	Hydra, Syra.
Total,	811,000	

The population is not correctly ascertained, and some reckon it less than 700,000. A university has been founded at Athens, the capital. Popular education is still in its infancy, though considerable has been done to favour it. In 1835, there were only four newspapers; and in 1836, the number had increased to twelve.

The principal commercial ports are Nauplia, Mesolonghi, Patras, Galaxidi, and the islands of Syra, Hydra, and Spezia. The number of Greek merchant vessels, in 1832, exceeded 1,000, exclusive of small craft or coasting boats.

The comparatively slight interest which in recent years the affairs of Greece have excited in the civilized world, after having for nearly a lustrum absorbed the sympathy of the best portion of the public, can hardly surprise us. It is natural to man, that only the moment of effort and action awakens the highest interest; he who has reached his object, has lost our sympathy. The enthusiasm with which the victor in a race is hailed, though ever so loud and boisterous, is only a lukewarm feeling, compared with the intense and breathless anxiety with which we follow his course and anticipate its undecided result. The ship we see from the shore, struggling with the waves, calls forth all our sympathy; while our eyes glance indifferently over the mass of vessels in the secure port, although the crippled condition of more than one of them may tell us the story of similar, and perhaps heavier struggles.

The picture, which Greece at present affords to the beholder, is indeed not dissimilar to such a ship. The wounds are still bleeding, which, at the moment we saw them inflicted, made our hearts tremble. The whole body of the valiant warrior, who not only has to cure these honourable wounds, but who has, and we fear long will have to suffer from the after-pains of a long and ignominious imprisonment, is still far from being healed; yet our attention has been turned to other objects, as soon as we thought the patient in a fair way of recovery. Greece as it is, can indeed excite our interest solely either in respect to what it has been, or what it hereafter will be. In its present state we strive in vain to find one satisfactory feature. Both in a moral and in an intellectual point of view, we still see the whole nation, partly in that state of vicious corruption, the unavoidable result of its long degradation; partly in that first stage of infancy, from which only time can release it. Time also only can inform us what results will follow from all that is new in that country. Legislation, administration, institutions for education,—every thing is *new* in the whole extent of the word; that is, not grown up out of the former condition of the country, but founded on principles foreign and incomprehensible to the mass of the nation, and carried over to it from other communities.

The only subject, which, in this great revolution of all things, has not itself experienced any revolution, is the literature of the modern Greeks. Nay, so far is this literature from having received any important influence from the shock which moved and turned all other affairs, that it is partly its very progress and influence to which this shock is ascribed. Be this as it may, the literature of modern Greece, although itself very modern as compared with that of most other European nations, yet appears in the present state of that country, with the exception of her religion, as the oldest of her institutions. And should it not excite our interest at least in this, if not in any other respect?

The origin of the Romaic or modern Greek tongue, as a *literary* language, the Greek literary historian, Rizo Néroulos, dates from the beginning of the last century. Until that time, the learned wrote without exception in the ancient Greek language, which, however corrupted and estranged from its classic purity, was at least very different from the vernacular tongue of the country. The same writer divides the history of modern Greek literature into three periods; namely, from 1700 to 1750; from 1750 to 1800; and from 1800 to 1821, or the beginning of the revolution. A more extended view of the different character of these periods than what is given in the body of the work, may be acceptable.

The first period must indeed be regarded merely as an introductory one. Most of the gifted men continued to write in the ancient language. Alexander Maurocordato was an exception, and his example exerted gradually a considerable influence on others, and the more, as he was one of the first Greeks who acquired any political weight among the Turks. He wrote a Grammar, a system of rhetoric, and several other useful books. But he rendered a far greater service to his nation, by obtaining permission from the government to establish schools in the different towns of Greece. The son of the same individual was the first Greek Hospodar of Wallachia. Before him, no member of this subjugated nation had ever been raised to a similar dignity.

The second period carried the higher classes of the Greek nation (not the common people) forward with giant steps in their progress. By far the greater portion of the productions of this period consisted indeed only of translations, especially from the French. But mental cultivation began to be of value in the eyes of the nation; by prince Mourouzi's influence on Selim III., the schools were multiplied and enlarged; and even various colleges were founded for the higher branches of learning. Towards the end of this period, many young Greeks began to visit foreign and especially German universities; and the result of it was, that even the philosophy of Kant was lectured upon in Janina. There were among the better classes not a few signs of high intellectual improvement. At the beginning of this period, the names of Samuel, the learned patriarch of Constantinople, of prince Caradza, of Theodoki, of Bulgaris, were mentioned with esteem; towards the end, those of Philippides, Psalidas, Benjamin, and others, were well known. The most celebrated name of this period, however, is that of the unfortunate and patriotic Rhiga. A Thessalian by birth, he had already made himself known among the more learned of his countrymen as the author of a work on natural philosophy, of a map of Greece, &c., before his patriotic songs made him the favourite of the whole nation.

The few years of the third period, which Rizo closes with the year 1821, (for what influence the revolution and the regeneration of Greece will have on her literature only coming years can tell,) did more for the mental developement of the Greek nation, and diffused more light among the people, than the whole previous century of a slowly dawning morn. Commerce was never so flourishing. Travelling in foreign countries became more and more frequent; and the number of Greek students in foreign universities increased. In comparing themselves with others, the Greeks became more powerfully affected with the feeling of their own degradation. They turned their attention more closely to the relics of their ancient glory, the writings of their classic forefathers. Their present language began to be the object of their care; and a noble national feeling became universal, that all mental acquirements, and the revival of science, in order to be lasting, could only be safely founded on their country's deliverance. The most distinguished name of this period is that of the well known Corais; a man equally esteemed as a scholar and a patriot, and who, as a writer, has exercised more influence than any other of his countrymen. His influence on the language is at present generally acknowledged. After many struggles with the champions of the modern language in all its corruptions, and with their adversaries, the indiscriminate advocates of the classic system, the middle way, adopted by Corais, seems to be universally chosen, namely, to enrich the language of the present generation from the treasures of the ancients, but without disturbing its basis; and to dismiss, as far as possible, the host of Germanisms and Gallicisms, introduced by the prevalence of translations. Among the writers of this period, the balance of talent seems to incline decidedly to history and its kindred topics. Many historical works were translated from foreign languages, and some original works of the same kind were written by J. Paliuris, Rizo Néroulos, Mustoxidi, Athanasius Ypsilanti, and others. A history of Souli and Parga, by Perevos, was highly prized by Niebuhr. As a poet, in the manner of the graceful Teian bard, Christopulo is highly esteemed; Solomo of Zante, Kalbo, Sakellarios, and others, are also well known disciples of the muses. But with the exception of history and poetry, Greece has hardly produced one original work of any importance. And although it is said, that during the last fifty years more than three thousand works have been published in the

Romaic language, yet the whole modern Greek literature must still be considered as a literature of translations. A few names of original merit can here be of no avail; and, indeed, even most of these are only distinguished as imitators of foreign originality. Thus, then, we may say, without being accused of harshness or rashness, that the modern Greek literature, notwithstanding the greater number of years during which it has existed, is still in an infancy analogous to that of the other institutions of Greece.

There is only one point of view, only one branch of literature (if we may consider it as belonging to literature), in which the modern Greeks appear as perfectly original, and as deserving the highest interest of thinking foreigners. We allude to their *Popular Poetry*.*

In respect to locality, two general divisions may be made in the modern Greek songs, namely, the songs of the mountains, and the songs of the coasts and the islands. The first, not always indeed composed by mountaineers, but even when made in the cities, for instance in Janina, calculated to please the inhabitants of the mountains,—are for the most part historical, and indeed mostly devoted to the achievements of the *klephts* or robbers; but ideal subjects also are not foreign to the mountain bards, and we find that some of the most beautiful and original among the romantic ballads had their origin in the mountains. In their form the mountain songs are mostly rougher, and composed with less skill, than those of the coasts and the islands.

The poetry produced on the Greek coasts, and on the islands, is frequently, but not always, in rhyme. The ballads are comparatively poor in historical interest. Most of their subjects are fictitious, and lyric songs are more frequent. Quite peculiar to these regions are the Katsakias, viz. a species of short songs in distichs, which remind us in some measure of the Spanish *seguidillas;* although they have no reference to dancing. Like them they are rather epigrammatic sallies, than expressions of feelings; jests and sighs of a sort of love, of which the imagination knows more than the heart. They are mostly extemporized.

In respect to character, the Romaic songs are subject to a threefold division. They are either *domestic*, or *historical*, or *fictitious*. Under domestic songs we include those which are composed for certain occasions, and are chaunted at weddings, on certain holidays, solemn partings, and the like. In reference to this species of songs, it will be found, that they are in general of more interest in respect to morals and manners, than to poetry. The Greek wedding-songs, like the Slavic, have moreover too close a connection with the ceremonies themselves, to be detached from them. The same is the case with the festival songs, devoted to St Basil's or New-year's day, and the first of March as the beginning of spring. All Greece resounds on this day with "The lay of the Swallow," a delicate and *naïve* song, lovely like the first breathing of approaching spring.

There is a certain class of parting-songs, peculiar to Greece. Commerce and necessity induce the Greek to leave his beautiful country; but, notwithstanding the numerous privations to which he must submit at home, and the various ill-treatment to which he was exposed during the many centuries of Turkish oppression, it is seldom his free choice that calls him away. The popular language designates foreign countries by the term *ἔρημος, the desert*. The pain of parting is increased by the uncertainty of the fate of those he leaves. The friends and relations of the wanderer's family assemble, take their last meal together, and join in songs, either such as are before known, or others composed expressly for the occasion.

More interesting still are the Myriologies, the solemn lamentations, or funeral songs. It is remarkable, that the Slavic nations, who celebrate every important scene of life with song, are deficient in this sort of poetry. The myriologies are said to be the most poetical of all the Greek domestic songs. They are always composed by females, and are mostly the productions of a momentary inspiration, that is, they are improvisations. There are, of course, certain forms, phrases, and images, always employed in them. The Greek women are also in the habit of preparing themselves for this duty, by singing lamentations on imaginary deaths, often only occasioned by the loss of a bird, or the withering of a flower; but the whole of the recitation must, of course, always be adapted to the occasion, and thus these preparations can only be incomplete. The myriology is not always pronounced by the chief mourner; often a neighbour, known to be practised and skilful, is called in, or comes of her own accord, to fulfil that solemn duty. The mere aspect of the house of mourning and of the corpse, puts her in a certain state of inspiration, which gradually rises almost to phrensy. Exhausted and half fainting after having finished, she can scarcely recollect what she has uttered; the hearers also are violently affected; and, amidst the general sobbing and groaning, it would be cruelty to sit down and write what would be so curious to read. Thus it seems natural, that hitherto only fragments of myriologies, remembered by some one of the audience, should have been written down.

Neither the historical nor the romantic ballads of the modern Greeks are of great antiquity. Of the Greeks, as of other nations, we must suppose that they always have had popular ballads. But their great vivacity, and perhaps their deficiency in that pious feeling so favourable to the preservation of the old,—that ancient trait, which causes all classes and ages to take the most lively interest in the *present*, in the *newest* affairs, and which now, as of old, is characteristic of the Greek nation,—together with the facility of making poems in their poetical language; all these circumstances have been the occasion, that the old ballads, from generation to generation, have been superseded by new ones. M. Fauriel has printed one, after a manuscript of the sixteenth century in the royal library of Paris; but this old piece, although by no means different in its genius from the modern, is of course no longer current. The oldest hero who appears in any of the present Kleptic ballads, is Christos Milionis, who lived towards the end of the seventeenth century. It is probable that at least the essential portion of the ballad is of the same age. Several others celebrate events at the beginning of the eighteenth century. By far the greater portion celebrate achievements of Klephts of our own time.

During the long period of the Turkish oppression, all those were called Klephts, or Robbers, who, in Epirus, Thessalia, and Macedonia, retired to the mountains, determined rather to brave the dangers of a wild and lawless life, than to obey the arbitrary pleasure of the Turkish Pachas and Beys. The government, despairing to conquer them, found it profitable to bring them under a sort of organization, uniting them with the *Armatoles*, a kind of militia in the service of the Porte, though consisting of Greeks, and instituted in very early times. The Klephts became now Armatoles, without changing much their way of life; and those only, who were entirely intractable, retired still deeper into the mountains, and founded the Klepht-villages, high on the mountains, and utterly inaccessible to military power. The names and trades of the Armatoles and Klephts were constantly confounded. To distinguish them, the organized military Greeks were sometimes called *tame* Klephts, the others *wild* Klephts. But even this difference gradually disappeared, in consequence of the increasing despotism of the Turks. Whenever a captain of the Armatoles had trouble with the Turkish magistracy, or heard that some Pasha or Dervendshibashi had something in view against him, he fled to the mountains, perfectly conscious that his band of Armatoles would soon follow him. In this way it might daily happen, that the police of a territory (for this the Armatoles strictly were) was changed into a band of robbers.

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* The merit of having made the literary world acquainted with the remarkable Romaic popular songs, in an extent to enable us to judge of their character, belongs to the learned Frenchman, Fauriel.

These Robbers are then the principal heroes of the Greek historical ballads. Although rough and vindictive, and leading a lawless life, every unprejudiced mind must feel that they are not to be looked upon in the same light as robbers in well-organized states. Their depredations were mostly, often exclusively, directed against the Turks; but even towards them they were seldom cruel, and not more revengeful than might be expected from a people so long oppressed, and in so low a stage of civilization. Highly laudable was their behaviour towards females; and Turkish women were as sacred to them as their own. They had, moreover, a certain respect for religion; and some of them are said to have been exemplary men in their domestic relations.

The songs relating to these heroes are composed in part by men of their own class, partly by the blind Rhapsodists, who go from village to village and gain their sustenance by singing them. These blind bards are comparatively seldom seen in the cities; if they come there, they choose the suburbs or the immediate neighbourhood of the gate, for their theatre. To the rural feasts, called *Panegyri*, which each village celebrates in honour of its patron saint, they repair in numbers, in order to sing and play to the dances, or amuse by their ballads. Some of them are even *improvisators*, and make verses on given themes. These, however, are exceptions; more of them are regular poets; while the greater portion are satisfied with repeating the inventions of others. Other poets, of still less pretensions, are to be found among the shepherds, the sailors, and especially among the women of all classes. In the cities, there are sometimes particular trades, among the followers of which there habitually exists poetical talent and productiveness. Thus a great portion of the songs chanted throughout Epirus, are composed by the tanners of Janina.

The melody in general accompanies the ballad: and its origin is just as uncertain. The tunes of the mountain songs, especially the robber-ballads, are in the highest degree simple, consisting of prolonged notes, similar to the ancient chants of the mass. Even when the words express triumph and victory, the tune in which they are sung is mournful and melancholy. In general, the same melody is repeated with every verse. In some cases the tune comprises two verses, but never more. The music of those ballads, which have their home in the cities of the coast or the islands, is far superior, and exhibits strongly the influence of the Italians. In some melodies ancient Italian tunes are distinctly to be recognised.

The songs of the mountains, and those of the cities and the Archipelago, form in reality two distinct classes. The mountaineers despise the more delicate songs of the cities and islands, especially those of which the subject is love. They consider them as effeminate, and as the productions of a vicious degenerate race. The inhabitants of the cities, on the other hand, take very little interest in the Klephts, and their joys or sufferings; and their monotonous ballads seem to them the tedious and rude productions of semi-barbarians, not worth their attention.

The great places of concourse for all the nations of the world, the khans or taverns of Constantinople, Odessa, and other marts of commerce, are also the only places where Greek ballads, of every description, meet together; and in such places, the traveller may hear the sweet songs of Scio, as well as the powerful ballads of Olympus and Pindus. Here too even the Greeks themselves feel the tie of their common country. The Ætolian mountaineer here feels that the man from Crete is his brother; and the native of Morea becomes aware, that one common mother bore himself, the Ionian and the Thessalian Greek.

GRENADA;* a beautiful island in the West Indies, is situated between the parallels of 12° 20′ and 11° 58′ north latitude, and 61° 20′ and 61° 35′ west longitude, nearly equi-distant from Tobago (60 miles) and the nearest point of the continent of South America. Its greatest length, north and south, is about twenty-five miles, and its greatest breadth twelve. Grenada was discovered by Columbus, in 1498, who found it fully occupied by a warlike race (the Charibs), among whom the Spaniards never attempted to form a settlement, and who remained for a century after in peaceable possession of their native home. In 1650, the French governor of Martinique, Du Parquet established a colony in Grenada, built a fort for its protection, and left the government of the island to a kinsman, named Le Compte. Within eight months after this period, we find a war of extermination carried on by the French against the Charibs. Grenada surrendered, on capitulation, in February, 1762, and, with its dependencies, was finally ceded to Great Britain, by the definitive treaty of Paris, on the 10th of February, 1763, Lucia being restored at the same time to France. The chief stipulations in favour of the inhabitants, as well by the treaty as by the articles of capitulation, were these:—First, That as they would become, by their surrender, subjects of Great Britain, they should enjoy their properties and privileges, and pay taxes, in like manner as the rest of his Majesty's subjects of the other British Leeward islands. Secondly, With respect to religion, they were put on the same footing as the inhabitants of Canada, viz., liberty was given them to exercise it according to the rites of the Romish church, as far as the laws of Great Britain permitted. Thirdly, Such of the inhabitants of Grenada as chose to quit the island, should have liberty to do so, and eighteen months allowed them to dispose of their effects. A legislative assembly was granted by Britain. On the 2d of July, 1797, a French armament, consisting of a fleet of twenty-five ships of the line, ten frigates, and 5000 troops, under the command of the Count d'Estaing, appeared off the harbour and town of St George. The whole force of the island was composed of 90 men of the forty-eighth regiment, 300 militia of the island, and 150 seamen from the merchant ships; and its fortifications consisted chiefly of an intrenchment, which had been hastily thrown up round the summit of Hospital hill. This entrenchment the Count d'Estaing invested the next day, at the head of 3000 of his best forces, which he led up in three columns, and, after a desperate conflict and the loss of 300 men, carried the lines. Never did so small a body of men make a nobler defence against such inequality of numbers. The governor (lord Macartney) and the remains of his little garrison immediately retired into the old fort at the mouth of the harbour, which, however, was wholly untenable, being commanded by the Hospital hill battery, the guns of which, having been most unfortunately left unspiked, were now turned against them. At daybreak the French opened a battery of two twenty-four pounders against the walls of the old fort. In this situation, the governor and inhabitants had no alternative but an unconditional surrender; and the Count d'Estaing became master of the island. Grenada and the Grenadines were restored to Great Britain, with all the other captured islands in the West Indies (Tobago excepted), by the general pacification which took place in 1793. An insurrection, fomented, it was said by the French revolutionists, broke out in March, 1795, which was not finally terminated until July, 1796. During the continuance of the disturbance, the greatest distress prevailed, and the most horrid murders were perpetrated by the infatuated rebels; whereever they appeared, devastation followed them; and, from the direful effects of their cruelty and rapine, Grenada has never recovered the flourishing state which it had previously enjoyed.

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* Abridged from "The British Colonial Library," by R. M. Martin, who owns his obligations for many of the details to the Grenada Almanac.

Grenada is divided into six parishes or districts, Saints Patrick, Andrew, John, Mark, David, and George. The two first named are the most productive in sugar, cocoa, and coffee. St John and Mark are mountainous, and the two latter named are rather less so. The principal (St George) contains the capital of that name, and the fortifications and military posts of Richmond hill, Fort king George, Hospital hill, and Cardinal heights; it is also the chief sea-port, the residence of the governor, and the station of the court of judicature, &c. The population of the capital and parish is about 10,000. St George, the capital, is situated within an amphitheatre of hills, with a good harbour in front. The houses are well and tastefully built of stone or brick, with sashed windows and tiled roofs, with the streets well ventilated, and a spacious handsome square in the centre. The harbour is said to be capable of containing 1000 ships, of 350 tons each, secure from storms. The population consists of 4000, of whom 320 are whites, and 2000 free coloured.

The dependencies of Grenada are, the island of Carriacou, and such of the small islands called Grenadines, as lay between it and Grenada. These are a cluster of isles, of more or less extent, between St Vincent and Grenada; the largest are Becquia, Canuan, Urion, and Carriacou: the last-named alone are dependent on Grenada; many are inhabited, and several well cultivated, producing small quantities of sugar, rum, molasses, cotton, fruits, vegetables, poultry, live stock, &c. in great abundance. Carriacou constitutes a parish, containing, according to estimate, 6913 acres of land; it is about nineteen miles in circumference. In the town of Hillsborough is a church and rectory. The island is, in general, fertile, and well cultivated; and the successful mode of the management of slaves is amply manifested in their constant increase. Cotton was formerly the chief article of cultivation, and about 1,000,000 lbs. was annually exported. Eight of the principal estates are now cultivated in sugar; and the average produce of that article in a good season is upwards of 2,000,000 lbs. The island is however greatly exposed to suffer from droughts.

In 1762, when Grenada surrendered to the British arms, it is said to have yielded annually, together with its dependencies, the Grenadines, a quantity of clay and muscovado sugar, equal to 11,000 hogsheads, of fifteen cwt. each, and 27,000 lbs. of indigo. The principal vegetable staples at present are sugar, cocoa, coffee, and cotton; and the following return shows the produce made in Grenada and the Grenadines in 1830.

Parishes and Island.	Sugar.	Rum.	Molasses.	Coffee	Cocoa.	Cotton.
	lbs.	Gals.	Gals.	lbs.	lbs.	lbs.
Par. St George	3.179,916	122.422	56,382	9839	20,022	7,139
—— Mark's....	958.276	34,533	11,784	5287	125.454	..
—— John......	913.247	29,450	7,880	7852	148,225	..
—— Patrick. ..	6,214,350	278,891	3,997	500	..	600
—— Andrew's	6,756,021	303,592	24,955	1500	39,670	..
—— David's...	1,853,443	114,550	6,368	1144	4,534	..
Isl. of Carriacou	2,225,700	9,996	144,313	..	..	90,055
Total....	22,100,953	890,434	255,679	26,122	337,903	97,804

The prices of produce in colonial currency was, in 1832:—

Sugar.	Rum.	Molasses.	Cotton.	Coffee.	Cocoa.
per 100-lbs.	per Gallon.	per Gallon.	per lb.	per lb.	per lb.
30s.	2s.	1s. 6d.	6d.	1s. 6d.	6d.

The following return shows the population of Grenada and the Grenadines, Dec. 31, 1832·—

Parishes.	Free, White and Coloured.		Slaves.		Total Males.	Total Females.	Aliens & Strangers.
	Males.	Females.	Males.	Females.			
Town of St George	922	1349	785	859	1704	2208	96
Parish of St do. ..	311	348	1942	2067	2253	2415	65
—— John	186	235	1086	1068	1272	1303	28
—— Marks ..	71	60	646	710	717	780	2
—— Patrick..	151	88	2042	2239	2193	2327	12
—— Andrew.	238	317	2377	2430	2615	2747	20
—— David's..	124	105	900	949	1024	1054	9
Island of Carriacou	207	256	1607	1753	1814	2009	18
Total......	2210	2758	11,386	12,085	13,596	14,843	250

The *white* population was, in 1829, town of St George, 177 males, 107 females; parish of ditto, 90 males, 28 females; St John's, 38 males, 34 females; St Mark, 25 males, 10 females; St Patrick, 84 males, 3 females; St Andrew, 94 males, 8 females; St David's, 38 males, 11 females; Carriacou isle, 50 males, 4 females:—Total, 596 males, 205 females;—total, coloured males, 1562; females, 2224.

The return to the slave compensation commissioners gives the number of slaves as 23,536; average value of each, £59 6s.; relative value of the slaves, £1,395,684; proportion of £20,000,000 to which Grenada is entitled, £616,444.

The people are ruled by a lieutenant governor, council, and house of assembly. The council consists of twelve members, and the assembly of twenty-six. In all cases the common statute law of England is the rule of justice, unless when particular laws of the island interfere. Since its restoration to Great Britain, in 1783, a protestant clergy have been established by law. Four clergymen are allotted to the whole, and each is provided with an annual stipend of £330 currency, £60 for house-rent, and a considerable portion of valuable glebe-land, which had formerly been appropriated to the support of the Romish clergy, for whose benefit a part of the grant is still reserved. There are eight places of worship, capable of containing 2870 persons; and the expenses of the church establishment to the colonists is about £1500 sterling per annum; that of five public schools is £430.

The following is the Grenada colonial revenue and expenditure, from 1821 to 1831, in pounds sterling:—

Years.	Gross Revenue.	EXPENDITURE.		
		Civil.	Military.	Total.
1821	11,325	10,512	800	11,312
1822	12,302	11,592	555	12,147
1823	10,360	8,722	720	9,442
1824	13,059	8,311	1704	10,015
1825	12,740	11,455	960	12,415
1826	16,658	15,273	659	15,931
1827	12,473	12,466	727	13,193
1828	13,810	11,304	838	12,142
1829	12,443	11,302	822	11,954
1830	12,268	11,132	761	12,722
1831	12,513	12,630	719	13,340

Principal exports from Grenada (except cocoa):—

Years.	Sugar.	Rum.	Molasses.	Coffee.
	Hgs.	Pns.	Pns.	Bags.
1823	16,766	11,288	3799	222
1824	5,263	8,663	1869	147
1825	15,848	7,964	2945	11
1826	15,441	8,358	2498	176
				lbs.
1827	12,695	7,730	1403	17,120
1828	20,171	9,464	3216	28,320
1829	No Returns.	No Returns.		
1830	13,268	2,777	864	31,504
				Bags.
1831	11,908	6,634	2464	6,103

Shipping employed by Grenada, in 1832:—

Places.	Inwards.		Outwards.	
	Ships.	Tons.	Ships.	Tons.
Great Britain	34	9899	34	9668
British Colonies	170	10504	178	11008
United States	25	4026	17	2956
Foreign States	32	1141	27	1282
Total	261	25570	256	24914
	1850	Men	1779	Men

GRENVILLE, WILLIAM WINDHAM, Lord Grenville, a distinguished statesman, was born Oct. 25, 1759, the third son of George Grenville, prime minister of England in 1763—5. He was returned to parliament in 1782; in 1789 he was elected Speaker of the House of Commons; the same year he was appointed secretary of state for the home department; in 1790 he was raised to the peerage, and the same year became secretary of state for foreign affairs, which office he retained till the resignation of Mr Pitt in 1801. He was the able representative and echo of that minister in the upper house. On the return of Mr Pitt to the premiership in 1804, without having stipulated for Catholic emancipation, lord Grenville refused to join him, and from that time till the death of Mr Pitt, he took a prominent part in the ranks of opposition. On the death of Mr Pitt in 1806, lord Grenville was appointed first lord of the treasury, at the head of a coalition ministry, which was of short duration; and he did not subsequently accept any prominent political office. In 1795, the profitable, but almost sinecure, office of auditor of the exchequer (salary £4,000) was conferred upon him; and in 1809, he was elected chancellor of the university of Oxford;—and these two offices he held till his death, which took place on the 12th Jan. 1834. The secret of the authorship of "Junius" is said to have been entrusted to lord Grenville.

H

HALIFAX, (*a.*) an ancient and populous town in the West Riding of the county of York, 197 miles N.N.W. from London, and 42 S.W. from York. The origin of the name is thus given by Whittaker: Where the parish church of Halifax now stands, there stood anciently a hermitage dedicated to St John the Baptist, the reputed sanctity of which attracted a great number of pilgrims from all quarters. Four ways, by which the modern town of Halifax is entered, still distinctly point to the church as their common centre; these were the roads by which the pilgrims approached the place of devotion, and hence the name of Halifax, or Holy Ways, *fax* being in Norman-French, an old plural noun denoting "highways." Halifax owes its prosperity to the vast increase of its woollen manufactures from the reign of Henry VII., when the manufacturers in the Spanish Netherlands, seeking refuge from the tyranny of the duke of Alva, settled in Halifax. Within a century, this place became so populous, that 12,000 men were sent from hence to join Queen Elizabeth's troops during an insurrection in the north. In 1642, the town was garrisoned by the forces of the parliament, whose cause the inhabitants seem to have espoused. Some idea may be formed of the extent and value of the woollen trade by the institution of a law for protection to the clothiers of Halifax against the depredations their goods were exposed to during their manufacture. The clothes being of necessity left all night in the fields to dry, were often stolen. By this local enactment, the magistrates were empowered to try and punish all persons stealing property valued at 1s. 1½d., within the precincts of the forest of Hardwick. The offenders were taken before the bailiff of Halifax, whose business it was to summon the constables of four townships within the liberty to require four free burgesses to appear and proceed to trial; if the accused was found guilty, he was executed on the principal market-day, by means of a machine resembling the guillotine. This was called "Gibbet Law," under which it is ascertained that, on an average, one execution took place every two years in the century preceding 1650: but on that year, the bailiff of Halifax being threatened with a prosecution, relinquished the custom, and the scaffold was taken down. The jurors, under this law, were not sworn; and bishop Hall, in his "Satires," insinuates that they were not impartial:—

> "Or some more straight-laced juror of the rest
> Impannelled on an Halifax inquest."

The earl of Morton, afterwards regent of Scotland, while in England in 1566, directed a model of the instrument to be taken, and, on his arrival in Scotland, had one of similar construction made from it. The instrument was so long unused as to obtain the name of the "Maiden;" but, in 1581, the earl himself was brought to the block, and suffered by the machine he had caused to be erected.

The chief articles of manufacture at Halifax are shalloons, taminets, moreens, shags, serges, baizes, coatings, and carpets; with narrow and broad cloths and kerseymeres, both for domestic use and for the army. It was some years ago computed that 10,000 pieces of shalloon alone were manufactured in this parish, considerable quantities of which were exported to Turkey and the Levant. The cloth-hall, or Piece-hall, as it is called, is a handsome edifice of free-stone, containing 315 apartments for the reception of goods in an unfinished state, which are exhibited for sale to the merchants every Saturday from ten to twelve o'clock. The manufactories are situated in the town and surrounding country, which is covered with villages, the poorer inhabitants of which are employed in spinning, carding, weaving, &c. Several cotton manufactories have been erected here, and succeed very well; and wool-cards of superior quality are made in the neighbourhood, which abounds with coal and free-stone. The Rochdale canal affords a medium of commercial intercourse with Liverpool, Manchester, and the western district; and the Calder navigation with Halifax and Hull.

The *parish* of Halifax is very large, being seventeen miles in length, and averaging eleven in breadth. It comprises 124 square miles, or 79,200 acres. The soil is naturally sterile, but it has been highly improved. We find in our authorities conflicting statements as to the population of Halifax, which may arise from different views of its boundaries. In the population return of 1841, the figures stand thus: Halifax town, 26,694; town and parish, 130,743.

HALSTEAD; a market-town in Essex, seated on the slope of a gravelly eminence, at the foot of which the river Colne runs, and which is crossed by a bridge at the southern side of the town. It is forty miles distant from London, and has a weekly market on Fridays. The name Halstead is Saxon, denoting a *healthy place*. A college was founded here in the reign of Edward III., for a provost and eight priests, by Robert Bourchier, lord chancellor of England; this institution remained until the dissolution of the religious houses. The church is an ancient edifice and has its tower surmounted by a wooden spire, which is the *third* that has been raised upon it: the *first* was destroyed by lightning; the *second* was erected in 1717, at the expense of an apothecary of the name of Firk, on which occasion Prior wrote some verses, but the spire they commemorate was, like its predecessor, destroyed by lightning; after which the present was built. Population of Halstead in 1841, 6230.

HAMMERSMITH; a populous district in the county of Middlesex, on the north bank of the Thames, three and a half miles west from London. Hammersmith comprises Brook-Green, Stanbrook-Green, and Shepherd's-Bush, and its population in 1841 amounted to 13,453. Its streets (with the exception of that which extends along the turnpike road,) are narrow, but the houses have a good appearance, and there are many handsome seats and villas in the vicinity. Brandenburgh house stood in this village, on the banks of the Thames. Near the church is a mansion said to be of the same antiquity with Hampton-court.

The most remarkable object in this place is the suspension-bridge over the Thames to Barnes and Surrey, commenced in 1825 and finished in three years. The Hammersmith bridge exhibits an example of construction not common in suspension-bridges; part of the road-way being *supported on*, and not hanging from, the main-chains. There being no natural rock on either bank of the river to which the main-chains could be secured, as is the case with most of those bridges to be found elsewhere, abutments of masonry were required, which, by their weight and magnitude, might be equally effectual. These are built of brick, faced with stone, and measure forty-five feet from back to front, forty wide, and fourteen deep, their top being on a level with the road-way: the weight of each of these masses is about 2160 tons, to resist the pull of the chains. These chains are carried through passages left in the brick work; and, entering the *face* of the abutment, proceed to chambers where they are bolted by powerful bolts, at the back of massive cast-iron plates, bearing against the front face of the chambers. The distance between the abutments is divided into three openings, by two suspension towers, or piers, forming Tuscan archways, supported by a rustic base, rising from the bed of the river; thus leaving three water-ways, two of 144, and the centre one of 400 feet. There are eight main-chains, arranged in four lines of twos, in each of which the chains are over one another, and not side by side. The two *outer* lines of chains consist of links eight feet ten inches long, made of three bars, each five inches broad and one thick: the two inner lines of chains have each six such bars, or are twice the width of the others. There are, therefore, altogether, thirty-six lines of bars, presenting a sectional surface of 180 square inches: the links are put together with coupling plates, fifteen inches long, eight broad, and one thick, in a similar manner to those of the Menai. The chains pass over friction rollers on the tops of the piers, as usual, but the rollers are supported in frames, so as to form two concentric arcs, one for each set of chains; the curves of the chains are tangents to these arcs, and the links that rest on the rollers are forged curved, to fit the arc formed by the set of rollers they rest on. By this construction there is no unequal strain on any part of the chains, and their pressure is made to act perpendicularly on the piers; the back-stays descending towards the abutments at an angle equal to that at which the chains between the piers descend from the rollers. The platform is divided by the suspension-rods into a central carriage-way, twenty feet wide, and a five feet footpath on each side. The transverse beams supported by the vertical rods, are in pairs, resting on a square plate attached to the end of each rod: besides longitudinal beams bolted down to these, and all the other usual precautions for durability, strength, and stiffness, the longitudinal beams, on each side the carriage-way, carry a set of trusses, like those of the roof of a house, which contribute materially to this object. The consequence of this admirable construction is, that the degree of curvature in which the road-way was originally laid, has not diminished at all, showing that no part of the abutments, piers, chains, suspension-rods, or framing, has given way; and yet the motion caused by a single carriage passing is perceptible to a foot-passenger, and the longer suspension-rods vibrate sensibly to the eye, proving that the strength and firmness is obtained by scientific skill in design and execution, not by a lavish expenditure of material. The back-stays intersect the road-way between the abutments and piers, at about one-fourth the distance from the former to the latter; for this fourth, consequently, the platform is above the chains, the transverse beams being supported by iron plates, resting on the coupling links of the lowermost line of chains beneath.

HANOVER, (*a.*) Since the accession of the house of Brunswick to the British crown, Hanover has been under the government of the kings of Great Britain; George I. was the second elector of Hanover when he succeeded to the throne of Britain in 1714. In 1814, Hanover was erected into a kingdom, and the king of Great Britain also became king of Hanover. But it is now separated from the British crown, inasmuch as the salic law, which excludes females from the throne, is in force in Hanover; and on the death of William IV., the crown of Hanover passed to his eldest brother, Ernest Augustus, formerly duke of Cumberland, who was born in 1771, and by his marriage in 1815 to the princess dowager of Solms, sister of the duke of Mecklenburg-Strelitz, has issue one son, George Frederick, born on the 27th May, 1819. On the 12th July, 1837, king Ernest issued a proclamation in which he expressed his dissatisfaction with the new constitution of Hanover, which had been acted upon by George IV. and William IV. declaring that he regarded it, "neither in form nor substance binding upon him." On the 1st Nov. same year, an ordinance was promulgated by king Ernest, suppressing the fundamental law of the state established by William IV. on the 26th Sept. 1833. This caused much dissatisfaction in Hanover, and a strong sensation throughout Germany. The election of a deputy from the city of Hanover to the Assembly took place in Feb. 1838, when the popular, in opposition to the government candidate, was elected. This election, however, was declared void by the king, because it was made with a reservation of the rights acquired by the city of Hanover by the constitution of 1833. In a long proclamation, dated Feb. 15, 1839, the king declared, that the legal representative constitution of the kingdom was settled by the royal letters patent of 7th Dec. 1819, and confirmed by the congress of Vienna in 1820, and that the change made in Sept. 1833 was destitute of constitutional form. A message to the assembly of the same date declares, that the constitution of 1819 alone is to be considered in force. The magistracy petitioned the Germanic diet to protect their laws and liberties, and to restore the constitution of 1833. To their petition the signature of M. Rumann, chief of the magistracy, was appended; and the king immediately suspended him from his office, and ordered him to be tried for his offence by the Hanoverian privy council. But the citizens, on the 17th July, proceeded in a body to the palace, and petitioned that Rumann should be tried by a municipal corporation. Serious riots occurred on the 19th July, which were not suppressed without bloodshed.

HARROW-ON-THE HILL, (*a.*) The free school of Harrow was established in 1571. The person to whose benevolence and care, England is indebted for one of her best public schools, was John Lyon, a wealthy yeoman, who had previously spent a considerable sum in teaching poor children. In the year 1590, two years before his death, he drew up a set of statutes for the school, with full instructions for the disposal of the estates, which he intended to appropriate to various charitable uses, at the same time appointing six trustees of his property; the election of successors to be made by themselves as a body. The revenues of Mr Lyon's estates are now considerable. But it has happened, unfortunately for the interests of the foundation, that those portions of his property which have, from their situation, acquired the greatest increase of value, such as certain lands near London, at Kilburn, and in the parish of St Mary-le-bone, were appropriated by him to other charitable purposes, especially the repairing of roads, in the neighbourhood of his own home. The late Richard Gregory, Esq. of county Galway, Ireland, by a codicil to his will, dated Oct. 22, 1838, bequeathed to Harrow School 140 volumes of Roman classics, an annual gold medal, value ten guineas, and a hundred pounds a year for ever, to found an exhibition for boys educated at Harrow going to the Oxford or Cambridge university. Several scholarships have also been founded by Joseph Neeld, Esq., one of the governors of the school.

The rules to be observed in the management of the school were drawn up by Mr Lyon. These are precise and, in some particulars, extremely curious. The system of education is marked out as a *classical* one. The modes of correction are specified. The amusements of the scholars are limited to "*driving a top, tossing a hand-ball, running, shooting, and no other.*" The twenty-second rule contains the provision "that *no girls* shall be received to be taught in the same school." The practice of archery was common in the school from the period of its foundation. Every boy was entitled by the statutes to possess "*bow-shafts, bowstrings*, and a *bracer*, to exercise shooting." Archery was a sport formerly used at many schools. The name which a part of the play-grounds at Eton college retains, that of the *shooting-fields*, may be attributed to a similar custom: and the term, *the butts*, will be found in the immediate neighbourhood of other schools besides Harrow. There is an instance of this in the college-school at Warwick, and at other places. The public exhibitions of archery at Harrow, were annual, and can be traced back for more than a century. The last silver arrow was contended for in July, 1771. There were good and sufficient reasons for the abolition of this practice, and the more scholar-like and intellectual one of public speeches has taken its place. These are held every year, in May, June, and July. On the 22d Oct. 1839, a fire broke out at Harrow school, which destroyed a great part of the building.

HARTLEPOOL; a sea-port town in the county of Durham, 253 miles N.W. from London. As a sea-port, it is dependent upon Newcastle, and it formerly possessed a harbour within the walls, defended by two strong towers, which are now decayed, and the harbour is choked up; the modern harbour, which will only admit vessels of light burden, being to the south of the town. In the reign of Edward III. this port furnished five large ships to the royal navy, and was next in rank to the city of Durham. The fishery on the coast forms the principal employment of the inhabitants, which is, however, aided by several extensive coal-works in the vicinity. The town consists of one principal and several small streets; the neighbouring scenery is delightful, particularly along the sea-shore, where some good houses have been erected for the accommodation of those who resort to town for seabathing quarters. Here are two fine chalybeates, impregnated with sulphur. Population in 1841, 5236.

HASLEWOOD, Joseph, Esq., of Conduit Street, Solicitor, and F. S. A., was born in London, Nov. 5, 1769, and early in life was taken into the office of his uncle, Mr Dewbery, a solicitor in Conduit Street, whose partner and successor in business he subsequently became. Mr Haslewood's fondness for early English literature and bibliography naturally led him to the collection of a considerable library of black-letter lore and Elizabethan poetry, and the pages and fly-leaves of his books bear ample testimony, by their numerous MS. notanda, that he was not only a collector, but a reader of the works with which his shelves were so amply furnished. In books on angling, and in those of hawking and field sports, his collection was confessedly unrivalled. He was one of the founders of the Roxburgh Club, and left a very curious volume, tracing the rise of that society. His volume, under the quaint title of "Roxburgh Revels," records the annual festivities of the Club from its first meeting at the Old St Alban's Tavern, in 1812. Although neither a classical scholar nor an elegant writer, Mr Haslewood was a laborious and faithful editor of many rare and beautiful reprints of early English poetry and prose, which might otherwise have perished; and assisted several of the members of the Roxburgh Club in correcting and printing the volumes which they occasionally presented to the society. He died 21st Sept. 1833.

HATS. The word Hat seems to be derived from the Saxon *haet*, German, *Hatt, i. e.* a cover for the head. The modern term is used in distinction from a bonnet or cap; but, anciently, even a helmet was so denominated, as in the romance of *Kyng Alesaunder*—

> Of sum weore the brayn outspat
> Al under theo iren hat.

The hats of the Saxons (the most ancient of which we can find any mention made), were supposed to have been by no means universally worn; felt or woollen hats, however, they are known to have possessed. In the *Canterbury Tales* of Chaucer, the merchant wears "on his head a Flaundrish beaver hat;" and, in the Chronicle of Froissart, we hear frequently of the hats of the time of Edward III. and Richard II. White hats were, even in those days, worn at Ghent, in Flanders, and seem to have been used as the political badge of a party, though this is not quite certain. "Hats of biever and eustryde's (ostrich) fethers," are also mentioned. In the Journal of Beckington, secretary to Henry VI., 1442, is mentioned a "scarlet hat given as a new year's gift." Among the inventory of effects of Sir John Fastolfe, 1459, "j hatte of bever, lynyd withe damaske gilt, and also ij strawen hattes." In the *Ship of Fools*, printed in 1517, is an account of "the great hats that is set all upon one side." We have thus shown the antiquity of white hats, beaver hats, and hats worn on one side.

In the reign of Henry VIII. we find hats frequently mentioned, and in the privy-purse expenses of that monarch is this entry:—"Item, paid for a hatte and plume for the king in Boleyn, (Boulogne,) xv^{s}." As the value of money was much greater then than it is at present, we may conclude that hats were still articles of luxury, and only worn by the rich.

In the expenses of a nobleman at college, 1577, we find "a broad riding hat;" "a hat lined with velvet." About this time high-crowned hats came into fashion. In the reign of queen Elizabeth, hats appear to have become common, and beaver hats seem to have been first introduced into common wear. The following curious passage is from a rare book, published about 1585, called *Stubb's Anatomie of Abuses.*—"Sometimes they use them sharpe on the crowne, perking up like the spire or shaft of a steeple, standing a quarter of a yard above the crowne of their heads; some more, some lesse, as please the fantasies of their inconstant mindes. Othersome be flat, and broade on the crowne, like the battlements of a house. Another sort have rounde crownes, sometimes with one kind of band, sometimes with another,—now black, now white, now russed, now redde, now grene, now yellow; now this, now that; never content with one colour or fashion two daies to an end. And as the fashions be rare and strange, so is the stuffe whereof their hattes be made divers also; for some are of silk, some of velvet, some of taffatie, some of sarcenet, some of wool, and which is more curious, some of a certaine kinde of fine haire; these they call bever hattes of xx., xxx., or xl. shillings price, fetched from beyonde the seas, from whence a greate sorte of other vanities doe come besides; and so common a thing it is, that every servyng man, countreiman, and other, even all indifferently, doe weare of these hattes; for he is of no account or estimation amongst men, if he have not a velvet or taffatie hat, and that must be pinched and cunningly carved of the best fashion." Shortly afterwards the rim became remarkably broad, and when much worn was liable to hang down, from thence the name of slouched hats. In 1607, a horseman's hat is recommended to be "a hat which will sit close and firme upon your head, with an indifferent narrow verge or brim, so that in the saults or bounds of your horse it may neither through widenesse or unwieldinesse fall from your head, nor with the breadth of the brim fall into your eies, and impeach your sight, both which are verie grosse errors." In a play, called "*A Challenge for Beauty*," written by Heywood in 1636, there is a song describing the fashions of different nations, in words which will equally apply to the present period:—

The Turk in linen wraps his head,
  The Persian his in lawn too;
The Russe with sables furs his cap,
  And change will not be drawn to;
The Spaniard's constant to his block,
  The French inconstant ever;
But of all felts that may be felt,
  Give me your English beaver.

During the reign of Charles I., the commonwealth, and the reigns of Charles II., James II., and William III., very broad brims were in fashion. The inconvenience of these very broad brims being at length felt, first one, and then two flaps were made to turn up, until about the time of queen Anne, when the third flap was turned up, and the regular cocked hat formed. Cocked hats of various sorts, were for the ensuing fifty or sixty years, much in vogue. In the *Tatler* and *Spectator* they are frequently alluded to, and the "Monmouth Cock," the "Ramillies Cock," the "Hunting Cock," and the "Military Cock," are alluded to. In No. 532 is a letter from John Sly, haberdasher of hats, in which he says, "his hats for men of law and physic do but just turn up, to give a little life to their sagacity; his military hats glare full in the face; and he has prepared a familiar easy cock for all good companions, between the above extremes." About 1750, round hats became very prevalent among the lower orders, and cocked hats were considered as a mark of distinction from them. In the *Rambler*, dated 1751, a young gentleman says, that his mother exclaimed, "she would rather follow me to the grave than see me tear my clothes and hang down my head, sneak about with dirty shoes, blotted fingers, hair unpowdered, and hat uncocked." About 1780 round hats first became fashionable, and about 1790 cocked hats disappeared from common wear.

Feathers have been used as ornaments for the hat or cap from an early period. They were commonly worn as late as the reign of queen Anne. In the *Tatler*, No VII., "The bridegroom's feathers on his hat all drooped." It is also mentioned in other places in the *Tatler*, *Spectator*, &c. In some foreign countries it is considered a mark of honour. A heron's plume, set in diamonds, was presented by the sultan to lord Nelson. In China, peacocks' feathers are used for the same purpose. In lord Macartney's *Embassy to China*, it is said, that "in this dignity there are three degrees, according to the number of feathers granted to the wearer. He to whom three feathers had been granted, thought himself thrice great and happy;" "some were honoured with peacocks' feathers, stuck in an agate tube, and pendant from the bonnet." In modern times, and at present, feathers in the hat are only worn by dignitaries on state occasions, or by military men. Joachim Murat, once king of Naples, executed in 1814, generally wore a splendid ostrich plume in battle. Some of our readers may remember the superb plume worn by king George IV. at his coronation. Cocks' feathers, with the edges tinged in crimson, are common in the military dresses of officers of rank in England and Russia. In France a fringe of white feathers is worn.

In the days of chivalry, and for some short time afterwards, it was frequently the fashion to wear some distinguishing badge in the hat. It has continued to our times in the shape of a cockade. These badges, when given by a lady, were of course highly valued and carefully preserved; in the first year of Henry IV., we hear of the conspirators under the duke of Exeter that, "one ware on his head-piece his lady's sleve, and another bare on his helme the glove of his dearlyng." This custom is constantly alluded to in the history of those times. It is said, that a glove in the hat was worn as the favour of a mistress, the memorial of a friend, or a mark to be challenged as an enemy. When an adversary gave a challenge, he threw down his glove, which the other placed in his hat, whence the origin of this custom. Wearing yew in the hat, in mourning, is mentioned by G. Wither, in 1633;

But then, why mourn I not to open view?
  In sable robes, according to the rites?
Why is my hat without a branch of yeugh?

We do not know whether this custom of wearing yew as mourning still prevails to any extent in England, but a popular doggrel of the day, beginning,

"All round my hat, I wear the green willow,"

would seem to indicate that it is not entirely extinct. Particular plants were worn as badges of a party or family in ancient times. The Plantagenets derived their name from the circumstance of an ancestor wearing heather, or broom, in his helmet, (in Latin, *Planta genista.*) In Sir Walter Scott's novels, the *Monastery* and the *Abbot*, many of our readers will remember the holly, the badge of the Avenel family. The highland clans had each a peculiar tree or plant. The Welsh wear leeks on St David's day, in memory of the gallant behaviour of a party of Welsh troops in a battle, where, being posted in a garden, they put leeks in their caps. The Irish wear the shamrock on St Patrick's day, in honour of that saint, who is said to have refuted some persons who were arguing against the doctrine of the trinity, by plucking a leaf of it, and showing them that it contained Three in One. Oak-leaves are worn in many parts of the country, in memory of king Charles II. sheltering himself from his pursuers in that tree after the battle of Worcester; laurel is worn by the foot guards on the 18th of June, in memory of Waterloo.

Of cockades, the white is the well-known badge of the families of Stuart and Bourbon; blue, white, and red, of France; and blue, yellow, and red, of Belgium; orange, of the family of Orange-

Nassau, and thus of Holland, whence the party cry of *orange boven*, "Up with the orange;" black and yellow of Austria, black and white of Prussia, and red of Spain. Our own is, as must be known to all, black. It is the family badge of the electors of Hanover. White cockades are worn by servants in England at weddings, and it has been the fashion to have them as large as possible. Gold and silver hat-bands and loops were formerly much in fashion, but they are now confined to livery servants.

Hat Manufacture.—Hats formed of straw, willow, the bark of trees, and other materials of the same description, we find among the manufactures of nations in an early state of civilization, but the process by which a beaver-hat is formed, requires great judgment, an intimate knowledge of the effect of heat and moisture upon certain substances, and considerable mechanical skill. Great progress, therefore, must have taken place in the arts of life, in any nation, before a beaver-hat can be made.

The first part of the manufacture of a beaver-hat, is the making of what is called the *body*. The materials of which the body is formed, are rabbits' down, lambs' wool, and a small quantity of camels' hair. The camels' hair, which is a much longer fibre than either of the other two materials, assists greatly in binding together the substance of the body, much after the same manner as the hair used by the plasterer, in the making of mortar.

Proportionate quantities of these three substances being weighed, they undergo the operation of *bowing*. The materials are laid upon a level board, enclosed on all sides but one, to prevent their loss, when the bowstring is brought into action. The bow is large and strong, and formed of wood; not pliable, like the bow of an archer, but answering the purpose of a frame, over which a strong string of catgut is strained. The material being spread on the board, the bow is drawn down nearly to the table, the middle of its frame being held firmly in the workman's left hand, the string being now almost on a level with the wool, is drawn out with the right hand, and when allowed to recoil, it strikes the wool, and separates and mixes its fibres; which, after floating for a time in the air, gently descend, and lie in a loose flock, on the surface of the board. The bowing being repeated for a certain time, the wool is drawn into a conical or triangular shape, and while lying in this form on the board, it is pressed into a more firm substance, by the hardening-skin, a piece of half-tanned leather. When sufficiently solid for the purpose, a kind of paper model, that is, a piece of stiff paper, of the same triangular form as the hardened wool, but somewhat smaller, is laid on its surface, and the edges are folded over; the paper and wool are then laid aside, and another and equal quantity of material undergoes the same process. When ready for the purpose, the first portion which was prepared, along with the paper mould, is laid with its upper surface, downwards, on the second portion of prepared wool, the edges of which are also folded over, as in the first instance; by this means, the paper mould is covered on both sides with wool, and if both portions were united, would form a conical cap (the *body*.) In order, therefore, to unite the fibres, the newly-formed body is sprinkled with water, and pressed and rolled in various directions.

The paper mould is now removed and the cap is taken to the *battery*. This battery consists of a metal vessel, called the kettle, in the centre, surrounded by six or eight inclined wooden planes; the liquid in the kettle is kept nearly boiling, by means of a flue that runs round it, connected with a furnace. The body of the hat, which is at present nearly eighteen inches in width across its opening, has now to undergo the operation of thickening, which at the same time makes it smaller. For this purpose the workman dips it in the liquor contained in the kettle: this liquor is composed of dregs of beer, and a small quantity of oil of vitriol. The effect of the hot liquor is to cause the fibres of the body to shrink, and to become more closely incorporated, as well as thickened. Between each dip into the hot liquid, the workman rolls the cap up in various directions, so as to cause the parts to become more intimately combined. When, by constant rolling and dipping, the body is reduced to its proper dimensions, it is removed from the battery and dried.

The next process is to render the body waterproof: this is done by means of a solution of shell-lac in spirits of wine; it is then fit for covering with beaver, or any other wool. To effect this, a quantity of the material intended to be used is subjected to the same process of bowing and hardening, as the wools used in forming the body; but in this case, the body itself is substituted for the paper model, and the hardened beaver is laid on both sides, so as to cover it completely; it is then carried to the battery, and dipped and rolled until the beaver has attached itself to the body. It is most singular, that in this operation, the root end of the hair or wool employed invariably attaches itself the body, so that when dry, it appears as it did when growing on the back of the animal. The body is now turned inside out, and another quantity of beaver is applied in a strip along its margin, to form the under side of the brim of the hat. It is now completely covered, but is still in the form of a conical cap.

To make this cap into the shape of a hat, it is, while still wet, drawn over a wooden block in the form of the crown of a hat, until the peak of the cap is gradually obliterated and becomes a flat surface, forming the top of the hat, and the lower border of the body is drawn out flat on the slanting board of the battery, and forms the brim. It is then dipped in cold water, which immediately stiffens it by hardening the varnish. It is next *clipped;* that is, the beaver is cut into an equal length over the surface, like the pile in velvet, and afterwards carried to be dyed. The dyeing is managed in the same manner as in dyeing any other woollen goods, by steeping it in the vat of black dye. The only remaining process it has to undergo is that of *finishing*, which is performed by heat and moisture, and the use of a heavy iron to lay the hair all in one direction. The rim is also cut of an equal width all round, and it is fit to leave the hands of the manufacturer, to be bound and lined by women.

The furs and wools of which hats are manufactured contain in their early stage of preparation, *hemps* and *hairs*, which must be removed in order to produce a material for the better description of hats. This separation is effected by a sort of winnowing machine, which wafts away the finer and lighter parts of the furs and wools from the coarser. Messrs Parker and Harris obtained a patent in 1822 for the invention and use of such an apparatus, whose structure and functions may be perfectly understood, from its analogy to the blowing and scutching machine of the cotton manufacture, (see *Cotton Manufacture* in body of work.) Mr Ollerenshaw's machine is now generally employed for ironing hats.

Messrs Gilman and Wilson, of Manchester, obtained a patent, in 1823, for a peculiar kind of fabric to be made of cotton, or a mixture of cotton and silk, for the covering of hats and bonnets, in imitation of beaver. The foundation of the hat may be of felt, hemp, wool, which is to be covered by the patent fabric. This debased article does not seem to have got into use; cotton, from its want of the felting property and inelasticity, being very ill-adapted for making hat-stuff.

A more ingenious invention of John Gibson, hatter, in Glasgow, consisting of an elastic fabric of whalebone, was made the subject of a patent, in June, 1824. The whalebone, being separated into threads no larger than hay stalks, is to be boiled in some alkaline liquid for removing the oil from it, and rendering it more elastic. The longest threads are to be employed for warp, the shorter for weft; and are to be woven in a hair-cloth loom. This fabric is to be passed between rollers, after which it is fit to be cut out into forms for making hats and bonnets, to be sewed together at the joints, and stiffened with a preparation of resinous varnishes, to prevent its being acted upon by perspiration or rain. A very considerable improvement in the lightness and elasticity of silk hats has been the result of this invention.

Silk hats, for several years after they were manufactured, were liable to two objections; first, the body or shell over which the silk covering is laid, was, from its hardness, apt to hurt the head; second, the edge of the crown being much exposed to blows, the silk nap soon got abraded, so as to lay bare the cotton foundation, which is not capable of taking so fine a black dye as the silk; whence the hat assumed a shabby appearance. Messrs Mayhew and White, of London, hat-manufacturers, proposed in their patent of February, 1826, to remedy these defects, by making the hat body of stuff or wool, and relieving the stiffness of the inner part round the brim, by attaching a coating of beaver upon the under side of the brim, so as to render the hat pliable. Round the edge of the tip or crown, a quantity of what is called stop wool is to be attached by the ordinary operation of bowing, which will render the edge soft and elastic. The hat is to be afterwards dyed of a good black colour, both outside and inside; and being then properly stiffened and blocked, is ready for the covering of silk. The plush employed for covering silk hats, is a raised nap or pile woven usually upon a cotton foundation; and the cotton, being incapable of receiving the same brilliant black dye as the silk, renders the hat apt to turn brown whenever the silk nap is partially worn off. The patentees proposed to counteract this evil, by making the foundation of the plush entirely of silk. To these two improvements, now pretty generally introduced, the present excellence of the silk hats may be, in a good measure, ascribed.

Mr Carey, of Basford, obtained a patent in October, 1834, for an invention of certain machinery to be employed in the manufacture of hats. It consists in the adaptation of a system of rollers, forming a machine, by means of which the operation of roughing or plaiting of hats may be performed; that is, the beaver or other fur may be made to attach itself and work into the felt or hat body, without the necessity of the ordinary manual operations.

The improved stiffening for hat bodies proposed by Mr Blades, under his patent of January, 1828, consists in making his solution of shellac in an alkaline lye, instead of spirits of wine, or pyroxylic spirit, vulgarly called naphtha. He prepares his water-proof stiffening by mixing 18 pounds of shellac with 1½ pounds of salt of tartar (carbonate potas.), and 5½ gallons of water. These materials are to be put into a kettle, and made to boil gradually until the lac is dissolved; when the liquor will become as clear as water, without any scum upon the top, and if left to cool, will have a thin crust upon its surface of a whitish cast, mixed with the light impurities of the gum. When this skin is taken off, the hat body is to be dipped into the mixture in a cold state, so as to absorb as much as possible of it; or it may be applied with a brush or sponge. The hat body being thus stiffened, may stand till it become dry, or nearly so; and after it has been brushed, it must be immersed in very dilute sulphuric or acetic acid, in order to neutralize the potash, and cause the shellac to set. If the hats are not to be napped immediately, they may be thrown into a cistern of pure water, and taken out as wanted. Should the hat bodies have been worked at first with sulphuric acid (as usual), they must be soaked in hot water to extract the acid, and dried before the stiffening is applied; care being taken that no water falls upon the stiffened body, before it has been immersed in the acid. This ingenious chemical process has not been, to the best of my knowledge, introduced into the hat manufacture. A varnish made by dissolving shellac, mastic, sandarach, and other resins in alcohol, or the naphtha of wood vinegar, is generally employed as the stiffening and water-proof ingredient of hat bodies. A solution of caoutchouc is often applied to whalebone and horse-hair hat bodies.

The following recipe has been prescribed as a good composition for stiffening hats: four parts of shellac, one part of mastic, one half of a part of turpentine, dissolved in five parts of alcohol, by agitation and subsequent repose, without the aid of heat. This stiffening varnish should be applied quickly to the body or foundation with a soft oblong brush, in a dry and rather warm workshop; the hat being previously fitted with its inside turned outwards upon a block. The body must be immediately afterwards taken off, to prevent adhesion.

The ordinary bath for dyeing hats, employed by the London manufacturers, consists, for twelve dozen, of—

44 pounds of logwood;
12 pounds of green sulphate of iron, or copperas;
7½ pounds of verdigris.

The copper is usually made of a semi-cylindrical shape, and should be surrounded with an iron jacket or case, into which steam may be admitted, so as to raise the temperature of the interior bath to 190° F., but no higher, otherwise the heat is apt to affect the stiffening varnish, called the gum, with which the body of the hat has been imbued. The logwood having been introduced and digested for some time, the copperas and verdigris are added in successive quantities, and in the above proportions, along with every successive two or three dozens of hats, suspended upon the dipping machine. Each set of hats, after being exposed to the bath, with occasional airings, during forty minutes, is taken off the pegs, and laid out upon the ground to be more completely blackened by the peroxidizement of the iron with the atmospheric oxygen. In three or four hours the dyeing is completed. When fully dyed, the hats are well washed in running water.

A hat of a new species has lately been invented by a hat-maker of Paris. The leading principle is, cloth stretched upon a frame of wire. To a brim of ordinary felt is attached a ring composed of a stout slip of steel, of exactly the circumference of the head. Another similar ring, of the desired size of the crown, is connected with the first by means of four double wires curving slightly inwards, and jointed in the middle. By folding inwards at the joints, the intermediate pieces of wire allow of the two rings coming nearly together, in which case the whole mechanism looks like one ring with four radii pointing towards the centre. To bring the frame to its full stretch, a third and movable ring is introduced, which, being pressed downwards against the curved wires, falls into a series of notches, all of which are upon one plane, where it rests: thus, the whole frame is opened out as far as it will go; when it in some degree resembles, in structure, the well-known species of epergne used for supporting custard at table. It will easily be conceived, that, if a crown be fitted upon the second of the rings, and the space between that ring and the brim filled with a piece of cloth of the requisite kind, a complete hat is formed. It is only further necessary to mention, that, to an interior lining or rather more than the ordinary depth, a false crown is attached, and this crown, again, to the *third* ring, so that the only process required for causing the crown to sink into the brim, is to pull in a particular way at a certain part of the false crown, till the ring is jerked out from the notches, when the whole collapses into a bulk little greater than that of a common round supper plate. The utility of such a hat for travelling, for attending large assemblies, and many other purposes, must be obvious. The invention, after being honoured with several distinguished marks of approbation in Paris, and coming into general use in that city, has been patented with some improvements by a respectable hat-making firm in Edinburgh, who, in constructing it, employ a cloth of deep silk pile, of great fineness, manufactured in France, and which gives the hat a superior appearance to those of the beaver kind. In the important matters of lightness and durability, the mechanical hat, as the French call it, has an advantage over the ordinary kinds, and it is retailed at a lower rate. We are hopeful, however, that, ere long, as the means for carrying on the manufacture become improved, it will be possible to produce it at a cost little more than half of the present price of a good hat.

HEATH, James, A.R.A.; an eminent engraver, was the early associate and friend of Stothard, the artist: they may be said to have commenced their career of popularity and distinction at the same time. The old "Novelist's Magazine," published by Harrison, which extends to twenty-two royal octavo volumes, is adorned by the delicately finished engravings of James Heath, from the exquisite and imperishable drawings of Thomas Stothard. This work remains at the present moment, a monument of the supremacy of the genius and skill of Heath and of Stothard. Heath's fame as an engraver extended all over the continent, and was by no one more highly appreciated than by that distinguished artist, Raphael Morghen, at Florence. During many years he confined himself to book illustrations; but it was impossible that an artist of such high capabilities should fail to strike out a more enlarged sphere for the display and exercise of his art, and with equal success. The "Death of Major Pearson," from a painting by West, and, as a companion to it, the "Death of Lord Nelson," from a painting by the same artist; the "Dead Soldier," from a picture by Wright of Derby; a whole length of General Washington, engraved from American Stuart's well-known portrait in the possession of the marquis of Lansdown: and the portrait of Pitt, from the statue at Cambridge university, are a very few of the lasting specimens of Heath's graphic excellence. He died Nov. 15, 1834, aged seventy-eight. In private life he was esteemed and loved by the large circle in which he was known. He left behind him three children, George, sergeant-at-law; Charles, the eminent engraver; and Mrs Hamilton, who is understood to be almost equal to her brother as a professor of the graphic art.

HEBER, Richard, Esq., a distinguished book-collector, was the eldest son of Reginald Heber, (who succeeded his eldest brother as lord of the manors of Marton, Yorkshire, and Hodnet, Salop) and Mary Baylie, his first wife; and was half-brother to the amiable Reginald, bishop of Calcutta, who was by a second wife. Towards this brother he acted a most affectionate part, superintended his education, took great interest in his literary efforts, and was justly proud of his talents and virtues. Mr Heber was born in Westminster on the 5th of January 1773; and was educated under the private tuition of the late learned George Glasse. He then proceeded to the University of Oxford, and was entered at Brasenose College. There he cultivated assiduously an acquaintance with the Greek and Latin classics, and acquired that taste for them which accompanied him through life, and which was the means of introducing him to the friendship of Porson, Dr Burney, and other eminent scholars. There, too, it was that he laid the foundation of his extensive collection of books. During his stay at the university, he formed the design of editing such of the Latin poets as were not printed in Barbou's collection; in pursuance of which, he published "Silius Italicus," in two volumes, in 1792. It is characterised as being a well executed and useful book. "Claudian" was printed the same year, but has not been published The school for illustrating the Works of Shakespeare and other English authors, from the pages of contemporary writers—at the head of which were the Wartons, George Steevens, Dr Percy, bishop of Dromore, Mr Malone, and other eminent scholars—occupied, at the time Mr Heber entered life, distinguished rank in English literature. From the writings of these gentlemen, and his acquaintance with many of them, he imbibed a taste for old English literature; and this, joined to his natural love for the drama, led him to form collections of our ancient poets and dramatic writers, which for extent and richness have never been surpassed. In the year 1804, he succeeded, on the death of his father, to the estates in Yorkshire and Shropshire, which he augmented by purchase, and considerably improved. In the year 1806, he offered himself as representative for the university of Oxford; but was successfully opposed by the late lord Colchester. Whilst resident there as a student, he had become a great admirer of parliamentary oratory: and on any great question arising, was often known to leave the university at mid-day, to be present at the contests of Pitt, Fox, Burke, &c., generally returning to Oxford on the following day. He thus became conspicuous among his contemporaries as a warm politician; and he is supposed to have early formed the desire to become one of the representatives of the university, which was at length accomplished in 1821. He died unmarried, at Pimlico, Oct. 4, 1833.

Mr Heber's station in life, his easy fortune, his gentlemanly manners, literary acquirements, and agreeable conversation, caused his society to be courted at this time by all ranks; and few men could boast so extensive and valuable a circle of friends and acquaintances, among whom were many of the statesmen, wits, and chief literary and scientific characters of the day. The best testimony, however, to the estimation in which he was held is contained in the beautiful lines addressed to him by Sir Walter Scott, in the introduction to the sixth canto of his "Marmion."

Mr Heber was tall, strong, and well made; and, until his health was impaired, had the appearance of a person likely to live to an advanced age. In person and features he was not very unlike his brother, the bishop of Calcutta, though he was considerably taller, and better looking. He was very near-sighted. His address and manners were extremely courteous and gentlemanly. His cheerfulness and the charms of his conversation, which he knew well to adapt to please all ranks and ages, and supplied with a fund of amusing anecdote, rendered him a most acceptable and delightful companion. In addition to Greek and Latin, he acquired the Italian and French languages; and had some little knowledge of the Spanish and Portuguese. Besides the editions of Silius Italicus, and Claudian, already noticed, he superintended the publication of the third edition of "Ellis's Specimens of the English Poets," which was remodelled and greatly improved from his rich and unrivalled collection of old poetry. His valuable dramatic collection was ever in the hands of the late Mr Gifford, while he was editing Jonson, Massinger, and Ford. He also published an edition of Brewster's Translation of Persius, with the Latin text. These constitute, so far as is known, the extent of his literary labours; but he has left behind him a vast monument of his industry, in the catalogue and collections of a great portion of his library.

His mania for book collecting commenced, as we have said, at an early period of life; and at every sale he was a great purchaser. His library contained many of the principal treasures possessed by the late Dr Farmer, Isaac Reed, J. Brand, George Steevens, the duke of Roxburgh, James Bindley, Benj. Heath, J. Herry, Gilb. Wakefield, J. Kemble, E. Malone, R. Wilbraham, J. Dent, Dr Gosset, Sir M. M. Sykes, &c. He collected with great avidity the manuscript as well as the printed works of the early English poets; and was well acquainted with their contents and merits. He was very nearly becoming the purchaser of Mr Jean Francois Vandevelde's entire collection, which was sold at Ghent, contained in 14,000 lots; and he purchased an entire library of 30,000 volumes at Paris. He was in constant communication with most of the old booksellers in every city and town of the united kingdom; and those that periodically published catalogues frequently sent the sheets to Mr Heber by the post, as they were printed. On hearing of a curious book, he has been known to put himself into the mail coach, and travel three, four, or five hundred miles to obtain it, fearful to intrust his commission to a letter. Nor was it in English literature alone that his stores were extensive. His collection of Greek and Latin classics, Spanish, Italian, Portuguese, and French, very far exceeded any that ever was made by a private individual. His collection of *Mexican* books was singular indeed. He had an insuperable objection to books printed on large paper, because they occupied so much room on his shelves. Some years before his death he built a library at his house at Hodnet, which he is said to have filled. His residence in Pimlico, where he died, was filled like Magliabechi's at Florence, with books from the top to the bottom—every chair, every table, every passage, containing piles of erudition. He had another house in York Street, leading to Great James Street, Westminster, laden from the ground floor to the garret with curious books. He had a library in the High Street, Oxford, an immense library at Paris, another at Antwerp, another at Brussels, another at Ghent, and at other places in the Low Countries and in Germany. In short, there was neither end nor measure to his literary stores.

HEMANS, Mrs, a favourite modern poetess, was born in Duke Street, Liverpool, on the 25th Sept. 1794. Her maiden name was Felicia Dorothea Browne. Her father, a merchant in Liverpool, was a native of Ireland; her mother was a German lady, a Miss Wagner, but descended from some Venetian family, a circumstance which Mrs Hemans would playfully mention as accounting for the strong tinge of poetry and romance which pervaded her character from earliest childhood. When very young, some embarrassments took place in her father's affairs, which caused him to remove his family to Denbighshire, in North Wales. They here inhabited an old and spacious mansion (called Grwych or Griech) lying close to the sea-shore, and in front shut in by a chain of rocky hills. Her residence in this wild solitude, appears to have exercised a similar influence in developing the poetical tendencies of Felicia's mind, as the Highland hills exerted on the youthful genius of Byron. So early as the age of nine she composed some pieces which were published, with others of a little later composition, in 1808. At the date of this publication the authoress was under fourteen years of age, and her ardent sensitive spirit was so much affected by an unkind criticism which appeared, that she took to bed, and could not raise her drooping head for several days. The chastening, however, was probably of service in showing her the necessity of maturing her efforts by study and meditation. Her second production, entitled "Domestic Affections," appeared in 1812, and exhibited a progressive ripening of her powers. In the same year she was married to Captain Hemans. "This union (says her biographer, Mr Chorley) may be said to have closed, shortly before the birth of a fifth son, by a protracted separation." Several causes are said to have operated in leading to this unpleasing event. Captain Heman's health had been injured by his military career, so much as to render it necessary for him to exchange his native climate for the milder skies of Italy. It is undeniable, besides, that the tastes of the wedded pair had proved uncongenial, and their separation took place by mutual consent. Mrs Hemans afterwards lived with her children at a place called Bronwylfa, near St Asaph, whither her mother and sister had latterly removed. Here Mrs Hemans sought for the restoration of her mental composure, by ardently pursuing the studies which she loved, and by devoting herself to the education of her children. Though never placed at any public seminary, she had formerly acquired a slight knowledge of the Latin tongue, and she now made herself familiar with Italian, German, and other modern languages. This acquaintance she maintained and continued to improve through her life, as a variety of translations, from the Latin of Horace, the Portuguese of Camoens, the German of Goethe, and the Spanish of Herrera, executed at various times, will enduringly prove. One of her first compositions, after her separation from her husband in 1818, was connected with this branch of her studies—being a series of papers on Foreign Literature, which were published in the Edinburgh Magazine for 1819. The poems called the "Restoration of the Works of Art in Italy," "Modern Greece," "Tales and Historic Scenes," and the "Sceptic," were all composed during the years 1819, 1820, and 1821. Her poem of "Wallace" was published during the same period, and gained a private prize, as the poem of "Dartmoor" did a public one, from the Royal Society, in 1821. The "Siege of Valentia, the Last Constantine, and other Poems," formed a volume, published in 1823, and in the same year a tragedy, entitled the "Vespers of Palermo," was produced at Covent Garden. This play was too purely poetical for success on the stage. In 1827, she published her "Forest Sanctuary," and in the beginning of the following year her "Records of Women." In the latter year (1828,) on the occasion of her mother's death, she removed to Liverpool, and after a time took up her residence at Wavertree, a village three miles distant from that town. Early in the summer of 1829, urged by numerous invitations, Mrs Hemans paid a visit to Scotland. Her first residence was Chiefswood, the house of her accomplished friend and correspondent, colonel Hamilton, the author of Cyril Thornton. With a still more eminent admirer, Sir Walter Scott, she now became for the first time personally acquainted, and many interesting memorials of her intercourse with the great novelist are given in her letters, written during a short stay with him at Abbotsford. Mrs Hemans resided for some months at Edinburgh, after visiting Abbotsford, and was flatteringly entertained by the literary and polite circles of that city. She then returned to Wavertree, near Liverpool, and published, in the summer of 1830, her "Songs of the Affections," most of which had been published separately, in Blackwood's Magazine. In the same summer, she put into execution a long-cherished plan of visiting the Lakes in the north of England. Here she lived for some days with Mr Wordsworth at Rydal Mount, and afterwards resided for a week or two at a cottage called the Dove's Nest. From the Lakes, Mrs Hemans was again induced, in the autumn of 1830, to proceed to Scotland, where she resided chiefly at her friend Sir Robert Liston's seat of Lilburn Tower. It was during this visit at Lilburn Tower that Mrs Hemans formed a friendship, which led her to visit Dublin before returning to England. When she did return to her native country, it was only to make preparations for taking up her residence permanently in the Irish capital. Her own health had become of late precarious, from an affection of the heart, and this was one motive for the step in question. The views which she entertained for her boys formed another reason. After visiting Wales, Mrs Hemans took leave of England, in the spring of 1831, for the last time, as it unhappily proved. In Ireland, Mrs Hemans mingled little in society, excepting with a few intimate personal friends, of whom the archbishop of Dublin was one of the kindest and most attentive. The frame of the poetess was now progressively decreasing in strength, though her mind was unabated in its energies and activity. In 1833 and 1834, she prepared for the press and published three little works, "Hymns for Childhood," "National Lyrics, and Songs for Music," and "Scenes and Hymns of Life," in some of which her muse exhibited even a grander power and loftier object than it had yet done. In the beginning of 1835, she became so weak as to excite the deepest fears among her friends and the public. Her malady rapidly increased, and on the 16th of May she expired.

The harp of Mrs Hemans, it may be said, had two leading chords. The tones of the one sounded of high and chivalrous deeds and feelings; the other spoke of love, and the holy ties of domestic duty. These themes, sometimes apart, and sometimes blended together, were those on which the genius of the poetess loved to dwell and dilate. A feminine delicacy and gracefulness of thought and expression, with a rich abundance of imagery, and a never-failing harmony of versification, are the characteristics of Mrs Hemans' poetical style. A collected edition of her works, with a memoir of her life by her sister, has been published by Messrs Blackwood of Edinburgh.

Of the personal appearance of Mrs Hemans, Miss Jewsbury, afterwards Mrs Fletcher, has given the following account, describing her under the name of Egeria: "Egeria was totally different from any other woman I had ever seen, either in Italy or England. She did not dazzle—she subdued me. Other women might be more commanding, more versatile, more acute; but I never saw one so exquisitely feminine. She was lovely without being beautiful; her movements were features; and if a blind man had been privileged to pass his hand over the silken length of hair, that when unbraided flowed round her like a veil, he would have been justified in expecting softness and a love of softness, beauty and a perception of beauty, to be distinctive traits of her mind. Nor would he have been deceived. Her birth, her education, but, above all, the genius with which she was gifted, combined to inspire a passion for the ethereal, the tender, the imaginative, the heroic—in one word, the beautiful. Her knowledge was extensive and various, but, true to the first principle of her nature, it was poetry that she sought in history, scenery, character, and religious belief—poetry that guided all her studies, governed all her thoughts, coloured all her conversation. Her nature was at once simple and profound; there was no room in her mind for philosophy, or in her heart for ambition—one was filled by imagination, the other engrossed by tenderness. Her strength and her weakness alike lay in her affections; these would sometimes make her weep at a word; at others, imbue her with courage; so that she was alternately a 'falcon-hearted dove,' and a 'reed shaken with the wind.' Her voice was a sad, sweet melody, her spirits reminded me of an old poet's description of the orange-tree, with its

'Golden lamps hid in a night of green.'

or of those Spanish gardens where the pomegranate grows beside the cypress. Her gladness was like a burst of sunlight; and if in her depression she resembled night, it was night wearing her stars. I might describe, and describe for ever, but I should never succeed in portraying Egeria; she was a muse, a grace, a variable child, a dependent woman—the Italy of human beings."

HENRY, William, M.D., F.R.S., an eminent chemist, was the son of Thomas Henry, himself an eminent chemist and medical practitioner in Manchester. He received the early part of his education chiefly in the dissenting academy established in Mosley Street, Manchester, which was subsequently removed to York. He afterwards lived for five years in the house of the late Dr Percival, of Manchester; and he was accustomed in after life to trace mainly to the example and encouragement of that eminent physician and scholar, the origin of his own literary and scientific tastes. After quitting the doctor's house, he studied medicine in the university of Edinburgh; subsequently to which he was engaged for several years in general practice, in partnership with his father. He then graduated in the same university, and was for many years one of the physicians of the Royal Manchester Infirmary.

At an early period of life his taste was first directed to the study of chemistry, by observing his father and elder brother (who died young) ardently engaged in such investigations; and so long ago as the year 1797, a paper of his was read before the royal society, and is published in their transactions. His subsequent contributions to the society were numerous; and in 1809, he had the honour of being admitted a fellow. He also acquired the distinction of having Sir Godfrey Copley's medal awarded to him by the president and council, for experimental papers published in their transactions. Of the Manchester Literary and Philosophical Society he was a distinguished member, and furnished to their transactions some important papers.

To his favourite science, chemistry, he contributed during the course of his life many important accessions, particularly distinguishing himself in the difficult and delicate province of pneumatic chemistry. His analyses of gaseous bodies are singularly precise, and are still incorporated in the manuals of the science as the results now most deserving of confidence. An important law in gaseous chemistry was also discovered by him; viz., that the quantity of any gas which is capable of existing in a given volume of water, increases directly as the density of the gas above the water. As models of exact quantitative determinations in gaseous analysis, may be mentioned his memoirs on the gases obtained from the destructive distillation of coal and oil, and his ingenious and perfectly successful adaptation of the spongy platina to determine the constituents of complex gaseous mixtures not discoverable by other analytical processes.

His "Elements of Chemistry" have passed through many editions. As a writer, his style was eminently precise and logical, chaste and temperate, —receiving as much embellishment from the stores of a mind richly furnished with the elegant literature of his country, and gifted by nature with a keen sensibility to the beautiful in scenery, in poetry, and in art, as was compatible with the graver topics of the exact sciences. His mind, indeed, presented an unusual combination of habits of vigorous and accurate thinking, with a correct, or rather severe taste, in the expression of his own thoughts, and in the estimation of the works of others, and with a finely touched imagination, and a warm sensibility for all that was great and noble in human action, or in the creations of human genius. He was particularly successful in the intellectual portraitures he was called upon to draw of his friends, or of his fellow-labourers in the cause of science.

Dr Henry did not, in his devotion to chemistry and the kindred sciences, neglect the culture of purely medical science. His inaugural discourse on Uric Acid; his valuable Essay on Diabetes, and his researches in that extensive class of diseases which are recognised and treated mainly by indications and remedies supplied by chemical science, demonstrate his zeal in the improvement of practical medicine. More recently, about the time when the prevalence of the Asiatic cholera in this country excited so much uneasiness, he engaged in a very important investigation on contagion; in which he proved that various contagious poisons, as the vaccine lymph, and the contagious matter or effluvium of *scarlatina*, are decomposed by a temperature considerably below that of boiling water. Upon these facts, sustained by cautious and rigid experiments, he proposed a new and simple process for disinfecting clothes or merchandise. His paper on this subject attracted great attention abroad, and contains suggestions which there is little doubt will hereafter form an element of all sound quarantine laws. Still more recently he drew up a very able report on the present state of knowledge regarding the laws of contagion, for the British Scientific Association, which was printed in their transactions.

In early youth, he sustained a severe internal injury, the consequence of a fall, from the effects of which he never wholly recovered. He was, indeed, almost at all times, a valetudinarian; and it was to this cause that he was accustomed to attribute the general delicacy of his frame, and the irritability and exciteableness of his temperament. During the last few weeks of his life, he laboured under considerable depression of spirits, and great irritability, which was increased by the severe illness of his daughter, the wife of Mr Greg, of Bury. His manner towards his domestics became altered, and he had assumed a reserved tone of conversation. His indisposition seems to have been augmented by the excitement consequent upon his attendance at the meeting of the British Scientific Association at Bristol, from which he returned home with a considerable aggravation of the symptoms he had previously exhibited; and on the morning of Friday the 2d of September, 1836, he discharged a loaded pistol into his mouth: the ball lodged in his brain, and of course death instantaneously followed. At the time of his death he was aged 61. Dr Henry's character was of the most amiable and attractive description. His affections were ardent; his means affluent; and he was liberal in patronizing those aspirants in science who attracted his attention.

HEREFORD; the capital city of Herefordshire, is situated in the middle of the county, 135 miles, W.N.W. from London, and is bordered on the southern side by the river Wye. There are various probable derivations of the word *Hereford;* in Welsh, the word Hen-ffordd signifies the *Old Road;* in Saxon, the word Hereford signifies the *Ford of the Army.* But the ancient name was *Ereinuc:* some derive it from *Harold's Fort,* having been rebuilt and fortified by him after it had been destroyed by the Welsh. Hereford must have been a place of importance as early as 676, for about that period a synod was held here for the erection of a new see in Mercia, when Putta was chosen first bishop of Hereford. It was the capital of the Mercian kingdom, under the Heptarchy, and had a magnificent church as early as the time of Offa. In the time of Athelstan, the city was fortified, and the walls may still be traced. The cathedral of Hereford is a very venerable structure, although the architecture in some places is very incongruous with the general style of the building. The city abounds in charitable institutions.* Hereford has several good streets, which are broad and well paved, with many others of an inferior description. Great improvements have taken place within the last half century; the buildings in general are handsome; and the vicinity of the city, especially near the banks of the Wye, is extremely pleasant. The most important public structures not noticed, are the bishop's palace, the shire hall, a modern erection from the design of Mr Smirke, having in front a Grecian Doric portico; the town hall, a curious wooden fabric; the guildhall, the county jail, a small but neat theatre; the infirmary, a handsome building, and an asylum for lunatics. The manufactures here are those of gloves, formerly carried on to a great extent, flannels, and hats; several attempts have been made to introduce the woollen trade, but without success. Cider, hops, and tanners' bark are the grand articles of commerce; and the Wye being navigable here for barges of considerable burden, coal and other articles are brought from the Forest of Dean. Hereford was the birthplace of John Breton, who became bishop of this see, and is supposed to have been the author of a Treatise on the Laws of England, in the reign of Henry III.; of Dr Miles Smith, bishop of Gloucester, one of the translators of the Bible; of the famous Nell Gwynne; and of David Garrick. This city gives the title of viscount to the family of Devereux. Population in 1841, 11,367.

HEREFORDSHIRE; an inland county in the west of England, bounded on the north by Shropshire, on the east by Worcestershire and Gloucestershire, on the south by Monmouthshire, and on the west by Brecon and Radnorshire. In length from north to south it is about thirty-eight miles, in breadth from east to west about thirty-five miles, and its circumference is about 180 miles. It includes one city (Hereford), two borough-towns, five market-towns, 221 parishes,—some statements make only 176 parishes, — and about 800,000 acres. This county is in the province of Canterbury, in the diocese of Hereford, and in the Oxford circuit. The bishopric of Hereford contains the greater part of Shropshire, four parishes in Monmouthshire, six churches and chapels in Montgomeryshire, eight in Radnorshire, twenty-one in Worcestershire, the whole county of Hereford, except eleven parishes: in all, 379 churches and chapels, of which 166 are impropriate.

The principal rivers are the Wye, Lugg, Munnow, Arrow, Frome, Teme, and Leddon. Of all these, the Wye is the most celebrated for its picturesque beauties; it enters the county near Clifford, and is navigable to Hereford in barges from eighteen to forty tons, but the navigation is sometimes interrupted by a scarcity of water, or by the violence of the stream when swelled by the torrents from the mountains. The Hereford and Gloucester canal, begun in 1791, is not yet completed. There is another canal from Kingston to Leominster and Stourport; on it are two tunnels, one of 125, the other of 3850 yards. A line of Railway from Hereford connects that city with Abergavenny and Monmouth; another line from Kingston goes to Brecon by the town of Hoy.

The soil of Herefordshire is extremely fertile, both in pasture and arable: it is generally a mixture of marle and clay, with a large portion of calcareous earth. The substratum is mostly limestone, of various qualities, some approaching in hardness and beauty to marble. In the parts bordering on Gloucestershire, iron ore has been frequently met with; although none has been dug of late years; yet from the considerable quantities that have been discovered imperfectly smelted, and from the remains of hand bloomeries which have been found, there is no doubt that iron-works were established here in the time of the Romans.

The air of this county is in general pure, and consequently healthy, particularly between the Wye and the Severn.

The Herefordshire breed of cattle have long been esteemed superior to most if not to every other sort in the island: it certainly is a very superior class, of great size and weight, but small-boned; its colour dark-red, or brown, with a white streak along the neck to the shoulder; under part of the belly and the throat white; face, bald or spotted; horns, bright and spreading, but not long; the head, small; the race is active, tractable, and useful for the general purposes of husbandry. The show of oxen at Michaelmas Fair, at Hereford, cannot be exceeded by any annual collection in England. The provincial breed of sheep is termed the *Ryeland,* from a district in the vicinity of Ross; they are small, white, and without horns: in symmetry of shape and in flavour, they are superior to most flocks in England: in quality of wool, they are unrivalled among the native breeds.

Herefordshire shows plantations of fruit trees in every aspect, on every quality of soil, and under every culture; but the soil best adapted to most kind of apples is a deep rich loam, when under the culture of the plough. The time for gathering apples is generally the middle of October. In a plentiful year (called a hit), the produce is almost beyond imagination; the trees being loaded to excess, frequently break under the weight of the apples: at these times, indeed, the branches are obliged to be supported on props, or forked poles. This excessive fruitage occurs however but rarely, and the following year is generally unproductive. In years of abundance, twenty hogsheads of cider have been made from the produce of a single acre of orchard ground. The particular era when the plantations of Herefordshire acquired the peculiar eminence which they yet retain, was during the reign of Charles I., when, by the spirited exertions of lord Scudamore, and other gentlemen of the county, it became, in a manner, one entire orchard. The principal markets for the fruit liquors of this shire are London and Bristol, from which ports great quantities are sent to other markets in bottle. The county is not distinguished for manufactures, but at Ledbury and some other places, woollen cloth is made.

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* The total number of charities in Herefordshire is 730, and their aggregate annual income £13,153 3s. 6d. This revenue is distributed among 185 out of the 221 parishes of which the county consists; thus giving upon an average nearly four charities, and about £71 1s. 11d. to each parish. See an account of the Endowed Charities in Herefordshire, by James Wishaw, Esq., in the Quarterly Journal of the Statistical Society, vol. II. part iv. July, 1839.

The population of Herefordshire, according to census of 1841, was as follows:—

	Males.	Females.	Total.
	56,978	56,900	113,878
Of which there were—			
City of Hereford,	5,209	6,155	11,367
Broxash Hundred,	5,886	5,712	11,598
Gray Tree Hundred,	6,411	6,387	12,798
Radlow Hundred,	7,245	7,022	14,267
Wolphy Hundred,	6,488	6,598	13,086
Wormslow Hundred,	5,566	5,324	10,890

Representation of Herefordshire:—

	Members.
For the County *(no division)*	3
Hereford *(City)*	2
Leominster *(Borough)*	2
	7

By the Reform Bill, *Weobley* (40 voters) was disfranchised.

HERIOT, John, comptroller of Chelsea hospital, was born at Haddington, on the 22d of April, 1760, his father being the sheriff clerk of the county of East Lothian. After having passed through the country schools of Dunse and Coldstream, he was, in the year 1772, put to the high school of Edinburgh, in which he acquitted himself with great credit, and was then sent to the college. Various misfortunes, however, led to the breaking up of his father's little establishment in Edinburgh, and the family became dispersed. In 1778, he proceeded to London, and having entered the marine service, he embarked in the Vengeance, of seventy-four guns, commanded by the hon. captain Maitland. In this ship he proceeded, first to the coast of Africa, and afterwards to the West Indies. Captain Maitland here took the command of the Elizabeth, of seventy-four guns, and the Vengeance was assigned to commodore Hotham. This, of course, occasioned a total change of officers, and Mr Heriot was ordered on board the Preston, an old 50-gun ship. Not much liking her, he effected an exchange into the Elizabeth. In that vessel, which formed one of the fleet under the command of Sir Hyde Parker, he saw a little service; the Elizabeth being prominently engaged in an attack upon a French convoy, supported by the batteries of port Royal, and four sail of the line, on the 19th of December, 1779; and, in the battle of the 16th of April, 1780, between the British fleet, under Sir George B. Rodney, and the French fleet, under admiral Guicher, the Elizabeth maintained for a considerable time an unequal combat with two line-of-battle ships, and had nine killed, and sixteen wounded; among the latter of whom was Mr Heriot. He was also in the battle, or rather skirmish, of the 19th of May, in the same year. In July, 1780, he exchanged into the Brune frigate of thirty-two guns, commanded by captain (afterwards Sir Francis) Hartwell; and in that vessel encountered the dreadful hurricane which produced such devastation in the island of Barbadoes, on the 10th of October, 1780. So providential did Mr Heriot consider his escape on that occasion, that he kept the anniversary of the hurricane as a solemn festival for the remainder of his life. In November, 1780, the Brune was sent with despatches to England, and was afterwards employed to convoy a fleet of merchantmen to Quebec. On her return she was paid off. Having been promoted to a first lieutenantcy of the Plymouth division, Mr Heriot repaired to Plymouth, where he passed the whole summer of 1782: towards the end of that year, he was embarked on board the Salisbury, of fifty guns, and subsequently on board the Alexander, of seventy-four guns; but at the general reduction consequent upon the peace in 1783, he was placed on the half-pay list. His first act was to mortgage his half-pay, that he might assist his parents; a measure productive to him of much embarrassment and distress, but which he at the time gloried in; nor did any after occurrence lead to a diminution of the feeling which it then inspired. The next few years of his life were unmarked by any event that had not on it the impress of calamity. They were passed under very distressing circumstances, in a mere struggle for existence. During that period of sorrow and suffering, he wrote two novels: the composition of these relieved his mind from painful thought; and in one of them, "The Half-pay Officer," were detailed some adventures in which he had been personally engaged. They also produced a small fund, on which he lived for nearly two years.

Mr Heriot's pursuits now became wholly literary. He was employed in "The Oracle" at the same time that Sir James Mackintosh was retained by the proprietor of that paper to translate the French journals. Having a difference with the proprietor, he left "The Oracle," and joined "The World," of which he became the sole and responsible editor; but, in a short time, tired of the drudgery of endeavouring to redeem a falling journal, he quitted it.

Mr Heriot at length by his writings so recommended himself to one of the secretaries of the treasury, that he became his personal friend. That gentleman proposed his undertaking the establishment of a daily paper. Funds were supplied to him by two individuals connected with the government, but wholly out of their own pockets. Mr Heriot set briskly to work; a prospectus was issued in a few days, and on the 1st of October, 1792, "The Sun" appeared, and soon obtained an extensive, and, at that time, unparalleled circulation. "The Sun" was no sooner established, than Mr Heriot formed the plan of a daily morning paper, making the former a pedestal for the latter; and on the 1st of January, 1793, appeared "The True Briton." The two papers went on together; and though the labour of editing two a day was no doubt very fatiguing, yet, with the assistance of able coadjutors, Mr Heriot acquitted himself of his arduous task with great credit, until the year 1806, when he retired from its fatigues, and was appointed a commissioner of the lottery. In the year 1809, he was appointed deputy paymaster to the forces in the Windward and Leeward islands. He discharged the duties of this important post in a manner which obtained for him the high approbation of H.R.H. the duke of York; and on his return to England, in the year 1816, he was appointed comptroller of Chelsea hospital. In the year 1798, he published an account of the Battle of the Nile, drawn up from the minutes af an officer of rank in the squadron, which passed through several editions. He died on the 29th July, 1833.

HERTFORD or **HARTFORD**, the county town of Hertfordshire, is situated on the river Lea, twenty-one miles north from London. The Saxon monarchs often kept their court here; Alfred built a fortress to defend it against the Danes, who being entrenched at Ware, kept the surrounding country in a state of alarm. The town, in its outline, approaches to the shape of the letter Y; the castle being placed between St Andrew's street on the north, and West street and Castle street on the south, forming the horns of this figure; while the remaining part consists chiefly of Maidenhead and back streets, extending in one line east and west, and Fore street, which runs in a parallel direction with them. Among the principal edifices are the castle, founded by Edward the elder about 905, but rebuilt and probably enlarged after the conquest. In the reign of Edward III., John, king of France, taken prisoner at the battle of Poictiers, was an occasional resident in this fortress, as also was another captive prince, David, king of Scotland. It is now the property of the marquis of Salisbury. Other public buildings are the shire-house, or town-hall, erected from a design of Mr Adams, and completed in 1771; a neat sessions-house, where the assizes are held; a gaol, and penitentiary-house, built on the plan of Howard; and a market-house. The commerce of Hertford chiefly depends on the navigation of the Lea; and the most important articles of trade are wheat, flour, malt, and wool, much of which is sent to London, whence coal and other commodities are brought in exchange. Population in 1841, 5463.

HERTFORDSHIRE or **HERTS**; an inland county of England, of a very irregular form. On the north it is bounded for a few miles by Cambridgeshire: at a small building called Knowle's Folly, the counties of Cambridge, Herts, and Essex, meet. Essex forms the eastern boundary, divided from Herts by the Stort, and from Bishop's Stortford to its confluence with the Lea, east of Hoddesdon, to Waltham Abbey, near which it quits Hertfordshire: from Waltham Cross to West Hide, Hertfordshire abuts on Middlesex; the western boundary is formed by Buckinghamshire: and Bedfordshire bounds it on the west and north. Its greatest length is about thirty-eight miles, and its breadth about twenty-six miles: the extreme irregularity of its outline renders it very difficult to judge of its extent; it may be reckoned at about one hundred and forty miles in its boundaries; its superficial contents are estimated to amount to about 340,000 acres, or 530 square miles. Herts is in the province of Canterbury, in the dioceses of London and Lincoln, and is in the home circuit. Previously to the Roman invasion this county formed part of the territories of the Cassi and Trinobantes; at that period, Cassibelanus is said to have reigned at Verulam, now St Alban's, and was elected generalissimo of the British troops. When the southern parts of this country were afterwards settled by the Romans, this county formed part of the district called Flavia Cæsariensis. Under the Saxon heptarchy, Hertfordshire was divided between the kingdoms of the east Saxons and Mercia.

The climate is mild and the general aspect of the county is pleasant; it is most hilly towards the north, where several streams take their rise, and by their clearness show the nature of the soil to be rather hard in this part, which is not the case on the western side, the land being there rich and well-cultivated. The produce in wheat, barley, and oats is very considerable, and of the best quality. The grass lands are confined chiefly to the south side in the vicinity of Barnet. The chief trade of the county is in corn and malt, which is conveyed to London by means of the navigation of the river Lea. The manufactures, with the exception of some extensive paper-mills, are not of any importance.

The principal rivers are the Lea, and the Colne. The Lea rises near Lea Grave, in Bedfordshire, enters Herts near Bower-heath, and traverses the county from north-west to south-east, to its junction with the Stort, about a mile east of Hoddesdon; then runs nearly south, and partly forms the boundary of the county towards the east. The Maran, or Mimerun, rises near Frogmore, and with the Beane, which rises near Cromer, joins the Lea near Hertford: the Stort rises in Essex, and is navigable from Bishop's Stortford to the Lea, which is navigable from Hertford to its confluence with the Thames. There are many smaller streams, as the Rib, the Quin, the Ash, the Verulam, Verlam, or Mize, the Gade, and some others, but they are principally devoted to mills. The Grand Junction canal, which commences at Branston wharf on the Coventry canal, and runs to Old Brentford, where it joins the Thames, and also to Paddington, where it joins the Regent's canal, enters Herts above Berkhamstead, and follows the course of the Gade, and afterwards of the Colne, until it enters Middlesex.

The New River derives its supply from the Lea, the Maran, the Rib, the Quin, and Emma's Well. Perhaps no artificial stream in the world can boast of such services to the health and comfort and well-being of almost countless multitudes as the New River. Commenced by Sir Hugh Myddleton upwards of two centuries ago, it has fully realized all his most sanguine expectations, and although it effected his total ruin, it has furnished a princely revenue to his assigns.

The boroughs of Hertfordshire are Hertford and St Alban's; and the market-towns Baldock, Barnet, Berkhamstead, Bishop Stortford, Buntingford, Hatfield, Hemel Hempstead, Hitchin, Hoddesdon, Redbourn, Rickmansworth, Royston, Stevenage, Tring, Ware, and Watford. Three members of parliament are returned for the county, and two each for the boroughs of Hertford and St Alban's. Population in 1841: Males, 77,617; females, 79,590: total, 157,207.

HEXHAM, a town in the county of Northumberland, seated near the confluence of the North and South Tyne, twenty-one miles W. from Newcastle, and 278 N.N.W. from London. The town contains some good buildings, though the streets are narrow and irregular; in the centre is the market-place, a spacious and handsome quadrangle, on the south side of which are piazzas and other buildings; on the east, an ancient stone tower, forming the court-house of the manor of Hexham; and on the west, are the remains of the cathedral and conventual buildings. The peculiar manufacture of this place is tanned leather, for gloves, shoes, boots, &c. Many Roman antiquities have been discovered in the neighbourhood, which also contains ruins of castles and other works of the middle ages. Near the town, in 1463, was fought the sanguinary battle of Hexham, in which lord Montacute, brother of the earl of Warwick, at the head of an army of Yorkists, utterly defeated the Lancastrians, when the earl of Somerset, and several other men of rank, were taken prisoners, and immediately executed. In 1761, Hexham was the scene of domestic discord, an insurrection of the miners having taken place; they were opposed by the North York militia, and were not suppressed till after numbers of them had been killed and wounded by the troops. Several eminent persons have been connected with this place. Among the bishops of Hexham, were Cuthbert and John of Beverley, both canonized, and Acca, the friend of Bede; John of Hexham and Richard of Hexham, two monastic historians, were priors of the monastery; and Joseph Richardson, a comic writer of some eminence, was born here in 1758; John Tweddale, a learned and ingenious traveller, who died at Athens in 1799, was likewise a native of this place or its vicinity. Population of town and parish in 1841, 5989.

HIGGINS, Godfrey, Esq., F.S.A., of Skellow Grange, near Doncaster, and a magistrate for the West Riding of Yorkshire; was the only son of Godfrey Higgins, Esq., who purchased Skellow Grange, by Christiana Matterson; and succeeded his father in his estates, shortly after coming of age, May 23, 1794. Mr Higgins was the author of the following works:—" A Letter to Earl Fitzwilliam on the Abuses of the York Lunatic Asylum," 1814, 8vo. A second Tract on the same subject, together with the Report of a Committee of the House of Commons. " A Letter to the House of Commons," written at Geneva, immediately on the passing of Mr Peel's bill for the restoration of a metallic currency, in which the difficulties of carrying that measure into effect were pointed out. " An Address to the House of Lords and Commons on the Corn Laws," in which, together with a concluding pamphlet, published in No. LIII. of " The Pamphleteer," the leading doctrines of the new school of political economy are controverted. " Horæ Sabbaticæ," in which the Christian Sabbath, or the Sunday, is shown to be a human, not a divine institution,—a festival, not a day of humiliation,—to be kept by all consistent Christians with joy and gladness, like Christmas Day and Easter Sunday, and not like Ash Wednesday or Good Friday. " The Celtic Druids," 1827, 4to. " Mohammed; or the Illustrious. An Apology for the Life and Character of the celebrated Prophet of Arabia," 1829, 8vo. An able refutation of some of the extraordinary opinions promulgated in this work was written by Edward Upham, Esq., the author of " The History of Budhism," and inserted in the " Gentleman's Magazine," for January, 1830. Mr Higgins made a brief reply in the following month; and Mr Upham rejoined in March.

Mr Higgins married in 1800, Jane, daughter and heiress of Richard Thorpe, Esq.; and by that lady, who died at Bath, May, 18, 1822, had one son, the present Godfrey Higgins, Esq., of Skellow Grange; and two daughters. His death took place on the 9th Aug. 1833.

HIPPURIC ACID; a peculiar organic acid, which exists in the urine of the horse and cow. It contains, according to Liebig, the organic or compound radical of the benzoic acid, and hence, when boiled with acids, it readily yields the latter.

HOARE, Prince, Esq., Secretary for Foreign Correspondence to the royal academy, F. S. A. and M.R.S.L.; was the son of Mr William Hoare, a painter, and one of the original members of the royal academy, and was born at Bath, in 1755. He began his career as an artist, under the instructions of his father; came to London at the age of seventeen as a student at the royal academy, and afterwards continued his professional education by visiting Rome in 1776, where he studied under Mengs, and had Fuseli and Northcote among his companions. On returning, in 1780, to England, he devoted himself for a while to the practice of his profession in London; but ill health compelled him to relinquish the arts, and for the recovery of his strength he took a voyage to Lisbon. On his return he directed his attention to dramatic composition; and with such success, especially in small after-pieces, that many of them still retain their original popularity. His first production was a tragedy, entitled " Such Things Were," formed on the history of Kirk's cruelty in the reign of James II., and first acted at Bath on the 2d Jan. 1788, while Mr Hoare was absent at Liverpool. On the 16th of April, in the same year, his pleasant and popular comic opera of " No Song no Supper " was first acted at Drury Lane. On the 3d of May, 1791, was produced at the same theatre his musical entertainment called " The Cave of Trophonius;" and on the 23d of May, 1792, at the Haymarket, his " Dido, Queen of Carthage," translated from Metastasio, which, though aided by the performance of Madame Mara in the principal character, by the music of Storace, and by splendid scenery, met with but a cold reception. It was, however, his first published work. On the 11th March, 1793, his farce of " The Prize, or 2, 5, 3, 8," was first acted at the Haymarket, for Signora Storace; it was very successful, and became a stock piece. On the 16th December, in the same year, he again complimented Signora Storace on a similar occasion with the first performance of his farce of " My Grandmother," which was also favourably received. In 1795 he produced a musical comedy, entitled " The Three and the Deuce," afterwards printed in 1806. His next production was " Lock and Key," a musical farce, first acted at Covent Garden, Feb. 2, 1796, with great applause; and this was followed on the 30th of April by his " Mahmoud," a musical opera, performed at Drury Lane. At the same theatre, two days after, his first dramatic production was again brought forward, for the benefit of Mrs Siddons, under the title of " Julia, or Such Things Were," and it was then published. On the 25th April, 1797, another opera from his pen, called " The Italian Villagers," was produced at Covent Garden, and in the same year he wrote a musical entertainment called " A Friend in Need." In 1799 he produced a comedy entitled " Sighs, or the Daughter," from the German of Kotzebue; and " The Captive of Spilsburg," a musical entertainment altered from the French " Le Souterrain." His subsequent dramatic works were, " Children; or Give them their Way," a comic drama, and " Indiscretion," a comedy, 1800; " Chains of the Heart, or the Slave by Choice," an opera, 1802; " The Paragraph," a musical entertainment, 1804; " Partners," a comedy, 1805; " Something to do," a comedy, 1803. In consequence of being appointed, in 1799, to the honorary post of Foreign secretary to the royal academy, he published in 4to. 1802, "Extracts from a Correspondence with the Academies of Vienna and St Petersburg, on the Cultivation of Painting, Sculpture, and Architecture," a work afterwards continued at intervals under the title of "Academic Annals." In 1806, he published "An Inquiry into the requisite Cultivation and present state of the Arts of Design in England." In 1809-10, he edited, in two volumes quarto, "The Artist," a collection of Essays, written chiefly by professional persons, and to which he contributed several papers. In 1813, he published "The Epochs of the Fine Arts, containing Historical Observations on the Use and Progress of Painting and Sculpture." Besides these various works, he was also the author of a poem entitled "Love's Victims," and of a "Life of Granville Sharp," characterised by a delicate perception of Christian excellence, as well as a just taste. His last production was an Essay "On the Moral Power of Shakspeare's Dramas," read before the royal society of literature, and printed in their transactions. With this elegant and thoughtful paper he closed his literary career, establishing by arguments and facts the indispensable union of moral truths with dramatic and all literary excellence. He died at Brighton, Dec. 22, 1834. The intellectual endowments of Mr Hoare did not surpass his benevolence, integrity, and sincerity; the mildness of his manners and kindness of his heart won him the respect and affection of the refined and enlightened circle who enjoyed his friendship. He left his library to the royal society of literature.

HOARE, Sir Richard Colt, bart., the historian of Wiltshire, was born in that county on the 9th Dec. 1758, being the eldest son of Sir Richard Hoare, the first baronet. In 1783, he married the eldest daughter of lord Lyttleton, by whom he had a son. She died in 1785, upon which he left England, and spent several years in foreign travel. His observations made then were, in 1818, condensed and published in four volumes, with the title, "A Classical Tour through Italy and Sicily, tending to illustrate some districts which have not been described by Mr Eustace." He also published a Tour through Wales in 1806, and one through Ireland in 1807. His chief work, however, is his history of Ancient Wiltshire, 1821, 2 vols. folio. This was not completed to the extent he originally contemplated, but sufficient was produced to entitle him to a high rank among the illustrators of British and Roman antiquities. Sir Richard died on the 19th May, 1838. Besides the above, he printed a number of small tracts on points of local topography, &c. for private circulation only, and was a contributor to the transactions of the Society of Antiquaries and the Gentleman's Magazine. By the death of his son, his landed property and baronetcy devolved on his eldest half brother, the head of an eminent banking house in London.

HOGG, James, the Ettrick Shepherd, one of the most distinguished of Scotland's self-taught poets, was born in a cottage on the banks of the Ettrick, in the shire of Selkirk, on the 25th of January, 1772. His education reached no farther than being able to overcome the class that read in the Bible, and "defiling several sheets of paper in vain attempts to form a letter:" in all, he thinks "he might have been about half a year at school." A scene of uninterrupted labour and great privation marked his boyhood; and, at the age of fourteen, having gleaned from his scanty earnings the sum of five shillings, the bard in embryo laid it out in the purchase of a fiddle, on which he kept sawing away every night in the cow-house, to his own infinite delight, and the annoyance of every one around him. The Life of Wallace, and Ramsay's Gentle Shepherd, were among the first volumes that fell into his hands; and, strange to say, he was disappointed that they were not written in prose, as in attempting to follow out the line, he often lost the sense altogether. At the age of eighteen he made his first attempts in verse; and if they were of indifferent merit, ("bitterly bad," as he calls them,) they were at all events voluminous and varied; as they consisted of eclogues, epistles, comedies, pastorals, &c. On a visit to Edinburgh to attend the sheep-market, he ventured on a volume, which, as might have been expected from the author being entirely unknown, and the matter rather commonplace, was consigned to an early oblivion. The attention of Sir Walter Scott, then Mr Scott, about this time having being drawn to the poetical talent of Mr Hogg, by his advice he was urged on to the publication of a volume of ballads, which shortly after was ushered into the literary world under the title of the "Mountain Bard." These compositions emanating from a rough untutored mind, bore, notwithstanding, many secret indications of that high poetical imagination so peculiarly the gift of the author of "Kilmeny;" the ballad of "Sir David Græme," and one or two others, standing forth as beautiful pieces of composition, and among the happiest efforts of his muse.

His "Essay on Sheep," which gained the Highland society premium, coupled with the success of the "Mountain Bard," produced such a fund as tempted him to embark in some wild agricultural scheme, which of course failed; and he then determined on settling in Edinburgh, and following out the uncertain calling of a literary adventurer. He was scarcely well warmed in his new mode of life before he got some insight into the precarious trade in which he had now enlisted. His first volume was the "Forest Minstrel:" from this, a work of no great merit, no pecuniary return was received. At this bleak and cheerless period, however, when poverty was pressing hard upon him, the well-timed benevolence of his friends Messrs Grieve and Scott, with a kindness almost paternal, supplied all his wants; and, to the honour of the poet, he did not allow the merits of his kind patrons to pass without bestowing on them the meed of kind and grateful remembrance.

The "Forest Minstrel" having failed in the object of primary importance to its author (at this moment some pecuniary return), Hogg, with his poor and scanty knowledge of men and manners as they then existed, and having but barely dipped into contemporary literature, determined on starting a weekly periodical, which he christened "The Spy," the pages of which were to be wholly devoted, bating a few attempts at criticism, to moral essays, and the refined elegancies of polite literature. How he, who at this time "knew no more of human manners than a child," and "had read next to none," was fitted for his task, the reader may judge, and of course anticipate the unsuccessful termination of his work long before the expiration of the first year from its birth.

At this time, the darkest period of his life, when his literary speculations, from which he anticipated a livelihood, had all failed; harassed and disappointed, poor, and comparatively friendless—that hour when mediocrity sinks, and genius overcomes—the expectations of his few steady admirers were destined to be fully realised in the production of the "Queen's Wake;" a work which, overlooking a few defects of style, is one of the finest poetical attempts in the language. From the cold shade of neglect that had settled around him, he thus, by one bold effort, extricated himself, and emerged into the full sunshine of popularity and fame. The different tales that intersect the poem evince his complete mastery over the muse; whether stirring up the reader with the wild and hurried measures of "Young Kennedy," singing to him of the exploits of the Fairy Queen and her attendant sprites, with silver bells at each horse's mane, in the fine ballad of "Old David," descending to the queer and ludicrous in the "Witch of Fife," or in his unequalled poem of "Kilmeny" transporting him to another and a lovelier world, enriching the descriptions with an imagery almost supernatural, and presenting to his gaze landscapes of a beauty so surpassing, that earth, with all its tame realities, fades and grows dim before the sunshine of that heavenly dream. Altogether, this remarkable production emanating from a source so unexpected, produced at the time a great sensation in the literary world.

In 1815, Mr Hogg again appeared before the public in the "Pilgrims of the Sun;" a work of unequal merit, although possessing some splendid passages, well worthy of the now established fame of the poet. Its success at home was comparatively trifling; but in America two successive reprints were made of it, and ten thousand copies circulated through that country. Soon after the date of the "Pilgrims of the Sun" appeared "Mador of the Moor," a work in the Spenserian stanza, but greatly inferior to its predecessor, both in conception and in execution. The success of this work not being very satisfactory, the Shepherd now set himself down to collect pieces from the great living bards of Britain; but the refusal of Sir Walter Scott, coupled with other untoward circumstances, determined him on changing his original plan, and venturing on the bold step of writing imitations of the whole himself. Thus originated "The Poetic Mirror," a singular work, comprising many pieces of first-rate excellence; more especially the imitations of Wordsworth, Wilson, and Coleridge. This work passed into a second edition, and altogether was highly successful.

"Dramatic Tales," in two volumes, succeeded "The Mirror;" but, with the exception of "The Hunting of Badlewe," the volume contains little surpassing the ordinary standard. Not so, however, thought the author; who, laying the fault at the door of the public, and ascribing its failure entirely to bad taste on their part, abandoned poetry for the time, and set himself down seriously to excel in prose. "The Brownie of Bodsbeck and other Tales" was the result of this attempt. In 1819, he published the first volume of "The Jacobite Relics," a work of great talent, and considerable research. The second volume of this collection did not come forth until 1821; but in every point it fulfilled the expectation created by its predecessor: in the latter part of it, composed of modern imitations of Jacobite ballads, there are some of Mr Hogg's best lyrics. Very shortly after the publication of this last volume, "Winter Evening Tales" made their appearance. This work, comprising all his earlier efforts in prose, and here and there sprinkled with a legendary ballad, was one of his most successful publications. The stories of "Donald Campbell" and "Basil Lee" are among the best prose tales we know; especially the latter, which contains in the episode of the "Widow of Loch Kios" passages in the terrible and sublime to which we have no equal but in "Wandering Willie's Tale," by far the finest piece of *diablerie* in modern literature.

On the occasion of the king's visit to Scotland in 1822, Hogg welcomed his sovereign in "The Royal Jubilee, a Scottish Masque." In this poem there is an absurd blending of the serious with the ludicrous; but there are some fine touches, and not a few of his best songs are scattered throughout its pages. The Shepherd now took it into his head to become a novelist in right earnest; and in that capacity commenced writing for the London market. He now produced the "Three Perils of Man" and the "Three Perils of Woman," both in three vols. each, and other smaller prose tales. Turning from prose to poetry, Hogg came forth in an epic entitled "Queen Hynde:" not one of his happiest efforts, however, the story being too confused, and shrouded in a mystery from beginning to end, from which the reader never gets fairly cleared. Notwithstanding the fine bursts of imaginative feeling, and the scattered passages of high poetical excellence that here and there enrich the poem, we must still consider it as, on the whole, more in the light of a failure, than as any addition to his literary reputation. About this time he published in Blackwood's Magazine, a series of prose sketches unde the title of "The Shepherd's Calendar;" by far the most finished and interesting, with the exception of the "Queen's Wake," of all his works. There the Shepherd was at home; recounting the deeds of his early days; or the credulous chronicler of past events, stamping with the rich impress of his genius the most homely human episodes, and endearing them to our recollection by many fine passages of quiet pastoral beauty.

In 1832 Mr Hogg visited London; and during his short sojourn there was the lion of the day. He was dined, and be-praised, and flattered by the great; every one exhibiting more anxiety than another how to show his kindness, and extend his patronage. He died at his residence at Altrive Lake, on the Yarrow, on the 21st Nov. 1835, leaving a widow and five children. A beautiful uniform edition of his prose and poetical works has since been brought out at Glasgow, with a Life by Professor Wilson, to his intimacy with whom he owed a popularity, beyond his own fame as an author, by being made to figure in the "*Noctes Ambrosianæ*" of Blackwood, sometimes as the buffoon, but at the same time always as the man of genius—of honest, warm-hearted feeling, and prolific fancy.

In personal appearance Mr Hogg was a well-built, active, and muscular man; about the middle height; with a sharp, lively gray eye, an expansive forehead, and sandy hair; with a fresh and ruddy colour on his cheek, the concomitant of a sound constitution and good health. At times when he doffed the plaid, and visited the city in his new suit of sables, he had something in his appearance akin to the homely and benevolent minister of some quiet country parish, far away among the hills: but when in his yellow vest and his brown coat, with the hearty shake of the hand, and the gruff, homely, and heartfelt inquiry after "a' at hame," we had the warm-hearted sheep-farmer;—a lover of out-of-door exploits, and athletic exercises; "an angler by the streams, and a hunter on the hills."

HOME, Sir Everard, an eminent surgeon, was the son of Robert Home, Esq. of Greenlaw Castle, county of Berwick, himself a practitioner of eminence, and was born in 1756. At an early age he embraced the profession of surgery, which he studied under the celebrated John Hunter, who was his brother-in-law, and which he practised with the greatest success in the metropolis, for more than forty years. His surgical publications were voluminous, and of high repute. Among them were "Lectures on Comparative Anatomy," in two vols. 4to., in which are explained the preparations in the Hunterian collection, illustrated by 171 engravings; an "Hunterian Oration" in honour of surgery, and in memory of those practitioners by whose labours it has been advanced, delivered in the theatre of the college, February 14, 1814; and "Practical Observations on the Treatment of Ulcers on the Legs, considered as a Branch of Military Surgery, 1797;" "Observations on Cancer, 1805;" and "Practical Observations on the Treatment of Stricture in the Urethra and in the Œsophagus," 3 vols. 8vo. Besides these, Sir Everard contributed largely to the philosophical transactions, and a variety of ably-written articles to the medical periodicals of the day. His late majesty when prince regent, raised him to the dignity of a baronet, by patent, dated Jan. 2, 1813, and also conferred on him the appointment of sergeant-surgeon, in which office he was continued by William IV. Sir Everard was also surgeon to Chelsea hospital, and honorary professor of anatomy and surgery to the royal college of surgeons; for many years he was the president of the college. He died Aug. 31, 1832. Sir Everard married in 1792, and left a family.

HONEY STONE or MELLITE; a mineral, crystallised in honey yellow transparent octohedrons, which is found sparingly in beds of brown coal in Saxony. It consists of alumina united to a remarkable acid, of organic origin, to which the name of mellitic acid has been given. It is composed of carbon and oxygen, with a small quantity of hydrogen and is considered by some as represented by the formula $C_4\ O_3+HO$; by others as $C_4\ O_4+H$. According to the latter view the mellitic acid is a hydracid.

HOP, (*a.*) The hop is a genus of the class Monœcia XXI. and of the order Pentandria V. Its specific generic character consists of a male flower, calyx pentaphillous, or five-leaved, having no corolla, but anthers, with two pores at top. Female flower, calyx, an oblique entire scale of the Ament, or one large leaf; corolla none, but two styles, and one side within the calyx coated. The stalk is weak, and climbs spirally round the pole or support, ascending always from the right hand to the left, against the sun. The stalk and leaves are rough to the touch; upper leaves heart-shaped, lower ones divided into three lobes, serrated on the edges, and growing in pairs on long foot stalks opposite each other; the flowers in loose racemes; the male flower distinct, on branched peduncles; the female on peduncles, in hairs of the form of a strobilus or cone, composed of large imbricated calyces, containing one or two seeds. The scales of the strobilus are ovated, and of a yellow green. In botany there is but one description of hop "*lupulus;*" but the planters divide it into different species, such as the golden, the Flanders, the red and white ruff, the white, the oval, and the long square garlic: these all differ in colour, shape of their bells, quantity and time of bearing, and ripening. The golden hop, from Farnham in Surrey, brings the highest price in the market: this may perhaps arise from the care with which they are picked there, hop by hop, without being mixed with leaves, &c.; while in Kent, and other counties, they strip them off more carelessly; and it is common to find the stalk and leaves mixed with the hops in the bags.

The hop has been cultivated from time immemorial in Europe on account of the useful properties of its flowers in the preservation of beer. The female blossom is the part used; and as the male and female flowers are on different plants, the female only is cultivated. It is no where cultivated in the East, and although it grows wild in different parts of Asia (a fact which may not be generally known), its flowers are no where in that quarter of the world applied to a useful purpose. The generic name of the plant *humulus*, is formed from *humus*, "fresh earth,"—the hop growing only in rich soils; and the specific name of the common hop, *lupulus*, is a contraction from *lupus salictarius*, the name by which it was, according to Pliny, formerly called, because it grew among the willows, to which, by twining round and choking up, it proved as destructive as the wolf to a flock. It is rather curious that an allusion to the wolf is also contained in the ancient British name of the plant, *llewig y blaidd*, or "bane of the wolf." The current name, *hop*, seems to proceed from the Anglo-Saxon *hoppan*, to climb.

Hops are first mentioned in the English Statute Book in 1552, in the act 5 Edward VI. chap. 5, where lands "set with saffron or hops" are mentioned among other exceptions to the operation of the statute itself, which enacted that so much land should be kept in tillage as had been at any time in tillage since the first of Henry VIII. It does not appear, however, that the culture of hops proceeded very rapidly at first; for so late as the reign of queen Elizabeth they were fetched in considerable quantities from the Low Countries. But from an act of parliament in the year 1603, it seems that hops were then cultivated in great abundance.

Hop-plantations require some years to come to perfection, and it is rarely considered advisable to take any produce from them the first year after they are formed, as by this means great detriment is likely to be done to the future produce which they should afford. There are modes of planting, however, (as in Suffolk,) which render the practice of taking produce in the first season not injurious. Also when bedded or root sets have been used in planting, a small produce may safely be taken in the first season, as such plants are then as forward as those from cuttings in the second season.

The time of hop-gathering is a season of great animation and interest, and the motley groups that assemble to this labour are most amusing. The proper time for gathering the hops is indicated by their giving a strong scent, and the seeds becoming firm and of a brown colour. This usually happens early in September.

The stakes are pulled up with the plants still clinging to them, and are laid across a rough kind of *crib* or *bin* made of boards, and having four handles by which it may be carried. Boys and girls carefully pick off the heads of the flowers, and drop them into the crib, which is removed when it is full. The flowers are dried in a kiln as malt is, and are afterwards closely packed for preservation, in large sacks, called *bags* and *pockets*.

The produce of the hop is usually calculated by the amount of duty it affords to the revenue, which is charged at 18s. 8d. for every cwt. or 2d. per lb.; and each season realizes more or less than the preceding, according as the weather has been congenial, and the depredations of the *Hop-fly*[*] have been extensive. Most of the hops are consumed in our own country, the quantity exported being comparatively trifling: taking the produce of the year 1833, which amounted to 32,747,301 lbs. we can convey some notion of its extent by showing that the quantity exported in the same year amounted only to 1,662,003 lbs.

The entire land in England and Wales applied to the cultivation of hops, in the year 1833, we learn from parliamentary documents, amounted to 49,187½ acres, which is the sum of the following amounts in each excise district:—

District.	Acres.	District.	Acres.
Barnstaple (Devon)	8½	Oxford	10
Bedford	2	Plymouth (Devon)	4
Bristol	1	Reading (Berks)	7½
Cambridge	4	Rochester (Kent)	12,566¼
Canterbury (Kent)	8,641¼	Sarum (Wilts)	1,018¼
Chester	¾	Salop	3
Cornwall	4½	Stafford	½
Derby	139	Stainbridge	702½
Dorset	19	Suffolk	148½
Essex	378¾	Surrey	13¾
Exeter (Devon)	19	Sussex	9,179½
Gloucester	7½	Uxbridge (Middlesex)	7
Grantham (Lincoln)	29	Wales (East)	¾
Hants	1,386½	—— (Middle)	129
Hereford	12,071	—— (West)	¼
Isle of Wight	1	Wellington (Shropshire)	16
Lincoln	552¼	Worcester	2,087⅝
Northampton	1¾		

Total Acres. . . 49,187½.

The largest quantities of hops exported in 1833, were to Hamburgh, 875,193 lbs.; Havre, 126,360 lbs.; Calais, 122,752 lbs.; New South Wales and Van Dieman's Land, 93,821 lbs.; Elsinore, 58,559 lbs.; Rotterdam, 58,109 lbs.; Trieste, 56,824 lbs.; Ostend, 43,882 lbs.

The hop possesses many medical qualities, and is balsamic, aperient, and diuretic. In the spring time, while the bud is tender, the tops of the plant, cut off and boiled, are as good as asparagus, and are considered very beneficial; at that season the heads and tendrils are good to purify the blood in the scurvy, and most cutaneous diseases; decoctions of the flowers and syrups are of use against pestilential fever, and it is useful in hypochondria. A pillow stuffed with hops, and laid under the head, is said to promote sleep in fevers and delirium. It is also used by the dyer to die wool yellow, and from its stalks a strong cloth may be made. But the principal use of hops is in the preservation of malt liquor, which, by the addition of its strobile or bitter quality, is less apt to turn sour, more detergent, and more healthy. It is said to promote the vinous fermentation by its odoriferous principle, and, when infused or boiled with the wort, to increase its spirituous quality.

The counties which are most congenial to the growth of this plant are, Kent, Sussex, Surrey, Worcester, Hants, and Hereford, in which they flourish most abundantly. To the rural scenery of Kent, truly called the "Garden of England," the hopculture greatly contributes.

HOPE, Thomas, (*a.*) the author of "Anastasius," was a descendant from the Hopes (baronets) of Craig Hall, in the county of Fife. Early in life, possessing an ample fortune, he travelled over various parts of Europe, Asia, and Africa; and having with a refined taste, acquired a facility of drawing, he brought home a large collection of sketches, principally of architecture and sculpture. Soon after his return and settlement in London, he published "A Letter, addressed to F. Annesley, Esq., on a series of Designs for Downing college, Cambridge;" in which, founding his judgment on what he had seen and examined in the course of his travels, he criticised, with considerable severity, the series of plans, elevations, &c. which had been produced by Mr Wyatt. In consequence, as it has been said, of these criticisms, Mr Wyatt's designs were rejected; and Mr Wilkins was afterwards employed to commence the college. Having purchased a large house in Duchess street, Mr Hope devoted much time and study in finishing and fitting up the interior from his own drawings, and partly in imitation of the best specimens, both ancient and modern, in Italy. A description of this house will be found in the first volume of "The Public Buildings of London," by Britton and Pugin, accompanied by two plates representing the Flemish picture gallery, which was an addition made in 1820. A view of the old picture gallery, together with a catalogue of the pictures, was published in Westmacott's "Account of the British Galleries of Painting and Sculpture." His country mansion was at Deepdene, near Dorking; and thither he had removed a large number of his pictures, sculpture, and books, having built for their reception a new library, a gallery, and an amphitheatre to arrange and display antiques.

In 1805, Mr Hope published the drawings which he had made for his furniture, &c. in a folio volume, entitled "Household Furniture and Decorations." Notwithstanding the ridicule attempted to be cast on this work in the Edinburgh Review, it led the way to a complete revolution in the upholstery and interior decoration of houses. "To Mr Hope," says Mr Britton, in his volume entitled "The Union of Painting, Sculpture, and Architecture,"

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[*] This devouring insect makes its first appearance in the hop-garden in the spring, between the 10th and 30th day of May, usually about the 12th: and what is more remarkable, it *generally* appears on the same day in every hop district, however distant they may be from one another. At first it is in a winged state,—a solitary fly settling here and there on the under side of the young leaves. When the weather is warm, with mild rains during the last twenty days of May, these flies produce young ones, which are very small, and are called *deposit* or *knits:* with astonishing rapidity these knits become in a few days green *lice*—a larger form merely of the same animal. However, when the weather in May has been dry, cold, and windy, the *Hop-fly* has been frequently known to leave the plant and entirely disappear, even after remaining several days: while tarrying, it showed very evident signs of being uneasy, continually crawling about on the upper as well as the under side of the leaves, and on its departure leaving no deposit whatever. As soon as the little creatures are born they plunge their tube-like mouths into the leaf of the hop, and begin with voracious eagerness to suck away the sap. In this position they remain quite stationary, but gradually increasing in size for about ten days; when each individual begins bringing forth young ones, which it continues to do at the rate of from eighteen to twenty-five per day all the remainder of its life.

The Hop-fly is characterized by a soft oval body, a small head, semi-circular eyes, antennæ of seven joints, longer than the body, and a beak which arises from the under part of the head, between the fore-legs, and descends almost perpendicularly. The wings, when developed, are four in number, and the legs are very long and slender, compelling them, in consequence, to walk awkwardly. After their torpid existence in the shape of cocoons, or, as some erroneously call them, *eggs*, during the winter, the return of genial weather in the spring brings them into active life.

"we are indebted, in an eminent degree, for the classical and appropriate style which now generally characterises our furniture and domestic utensils. Like most other innovations, his was described as whimsical and puerile by some persons—as if it were unbecoming a man of fortune to indulge in the elegant refinements which wealth placed at his command: whilst others caricatured the system, by cramming their apartments with mythological figures and conceits, jumbled together without propriety or meaning." Mr Hope was, in all respects, a munificent patron of art and of artists, and even of the humbler mechanic; for he has been known to traverse obscure alleys, lanes, and courts, to find out and employ men of skill and talent in their respective pursuits. Thorwaldsen, the Danish sculptor, was chiefly indebted to him for the early support and patronage which he experienced. By him the genius of young Chantrey was called into action, whilst the more mature talents of Flaxman were honourably employed. In 1809, he published "The Costume of the Ancients," in two volumes, royal 8vo.; in fixing the price of which, in order to promote its more extensive circulation, he at once sacrificed £1000 of the cost. The figures, which were chiefly selected from fictile vases (many of them in his own collection), are engraved in outline, and the greater part of them by that eminent master in that style, Mr H. Moses. Three years afterwards, he published his "Designs of Modern Costumes," in folio. These works evinced a profound research into the works of antiquity, and a familiarity with all that is graceful and elegant. His "Anastasius; or Memoirs of a Modern Greek," an historical and geographical romance in three volumes, which appeared in 1819, evinced at once the general knowledge, the fancy, and powers of the author. It presents a faithful picture of the customs, manners, and countries of the Turks and Greeks. Besides these productions, he contributed several papers to different periodical publications; and, at the time of his decease, was engaged in passing through the press a work "On the Origin and Prospects of Man." That work has since been published. Mr Hope died on the 3d Feb. 1831. He married in 1806, the youngest daughter of the archbishop of Tuam, and left three sons.

HORN, (*a.*) The various uses to which the horns of cattle are applied afford a curious example of the ingenuity and economy with which our arts are prosecuted. The horn consists of two parts: an outward horny case, and an inward conical-shaped substance, somewhat between hardened hair and bone. The first process consists in separating these two parts, by means of a blow against a block of wood. The horny outside is then cut into three portions, by means of a frame-saw. The lowest of these, next the root of the horn, after undergoing several processes, by which it is rendered flat, is made into combs. The middle of the horn, after being flattened by heat, and its transparency improved by oil, is split into thin layers, and forms a substitute for glass in lanterns of the commonest kind. The tip of the horn is used by the makers of knife-handles and of the tops of whips, and similar purposes. The interior, or core of the horn, is boiled down in water. A large quantity of fat rises to the surface: this is put aside, and sold to the makers of yellow soap. The liquid itself is used as a kind of glue, and is purchased by the cloth-dressers for stiffening. The bony substance, which remains behind, is ground down, and sold to the farmers for manure. Besides these various purposes to which the different parts of the horn are applied, the chippings which arise in comb-making are sold to the farmer for manure, at about one shilling a bushel. In the first year after they are spread over the soil, they have comparatively little effect; but during the next four or five, their efficiency is considerable. The shavings, which form the refuse of the lantern-maker, are of a much thinner texture. A few of them are cut into various figures, and painted and used as toys; for they curl up when placed in the palm of a warm hand. But the greater part of these shavings are sold also for manure, which, from their extremely thin and divided form, produces its full effect upon the first crop.

HORNER, Francis, an able parliamentary speaker, and one of the early writers in the Edinburgh Review, was born at Edinburgh on the 12th of August, 1778, and was the son of a respectable linen-draper in that capital. When sufficiently old, he was sent to the high-school of Edinburgh, where, with much praiseworthy diligence, he made himself a distinguished scholar among numerous contemporaries. From this place he proceeded to the university of that city, and under the auspices of the celebrated Dugald Stewart, he advanced highly in his studies, and among other acquaintances, became intimate with lord Henry Petty. This nobleman, in 1806, held the office of the chancellorship of the Exchequer, and through his interest the return of Horner to represent the borough of St Ives in the imperial parliament was secured. At the next election following, however, he lost his seat, and then betook himself to the profession of the law, and after due time was called to the bar. Subsequently, on the resignation of viscount Mahon, he supplied that nobleman's place, as member for Wendover; and immediately was nominated to the commission for investigating the claims upon the Nabob of Arcot. Arcot is a considerable district of Hindostan, forming part of the Carnatic; and for the many services done by the East India Company to the nabob and his son, the nabob, Azim-ul-Omrah, formerly ceded the whole district to the East India Company by treaty, in 1801: and on this occasion, the British government undertook to adjust the claims made by the creditors of the nabob, for whose satisfaction an annual revenue of 340,000 pagodas was set apart. Commissioners were, in consequence, appointed both in India and in London, for the investigation of the claims, and these boards have been in existence, and in operation, since 1805, endeavouring to unravel the mysteries in which the accounts were involved for fraudulent purposes. Out of a sum exceeding thirty millions sterling, claimed against the estate of the nabob, the commissioners set aside claims to the amount of upwards of twenty-seven millions on the grounds of fraud, and of that very common crime in India, forgery. Mr Horner was appointed one of these commissioners; and in 1810, likewise, he was chosen on the bullion committee, during which service he made a most elaborate, though unsuccessful effort for the return of cash payments. He supported alderman Combe's motion, to pass a vote of censure on ministers for having obstructed an address to his Majesty, from the lord mayor and corporation of the city of London; and on the regency question being discussed, proposed the appointment of a regent by address, rather than by bill, because, as he contended, by the latter mode parliament would usurp the legislative power of the crown, and by a gross and illegal fiction, steal the semblance of an assent, where there could be no negative. During the debate in 1812, relative to the two tellerships of the exchequer, he made seven distinct motions on the subject, with a view to confine those sinecures to fixed annual sums, all of which were however negatived. Thus did Mr Horner most indefatigably devote himself to the public business of his country, till at length over earnestness, and too great application, broke down his constitution. In this unfortunate exigence, his medical advisers urged him to retire from public life, and try to amend his health by a change of climate. He accordingly visited France, and proceeded onwards to Italy; but his disease gained upon his strength; and while at Pisa, he was completely overcome, and died. This event happened in February, 1817, when he had only reached thirty-eight years of age. A monument was erected to his memory in Westminster Abbey.

HORSBURGH, James, F.R.S., a distinguished hydrographer, was born on the 23d September, 1762, at Elie, in the county of Fife, in Scotland. His parents, though in a humble sphere of life, were pious and respectable. At the age of sixteen, having acquired the elements of mathematical science, book-keeping, and the theoretical parts of navigation, with a view to a sea-faring life (to which the maritime position of his native place, on the Frith of Forth, probably invited him), he sailed in various vessels, chiefly in the coal trade, from Newcastle and the Frith of Forth, to Hamburgh, Holland, and Ostend. In May, 1780, he was captured by a French ship of twenty guns, close to Walcheren, and detained in prison at Dunkirk for a short time. After his liberation, he made a voyage to the West Indies, and, on his return, proceeded to Calcutta. In 1784, he was made third mate of the Nancy, bound for Bombay. He continued in this trade for about two years; and in May, 1786, when proceeding from Batavia towards Ceylon, as first mate of the Atlas, he was wrecked upon the island of Diego Garcia, owing to the incorrectness of the charts then in use. This circumstance taught him the advantage of making and recording nautical observations. On his return to Bombay, he joined, as third mate, the Gunjava, a large ship belonging to a respectable native merchant, and bound to China. On the vessel's arrival in China he became first mate, and in that capacity he continued to sail backwards and forwards, in that and other ships, between China, Bombay, and Calcutta, for several years. His experience and observation had now not merely furnished him with a large share of practical skill, but enabled him to accumulate a vast store of nautical knowledge, bearing especially on Eastern hydrography. By the study of books and by experiments, he familiarised himself with lunar observations, the use of chronometers, &c., and taught himself drawing, etching, and spheres, devoting his time, when in port, often till midnight, to these studies. During two voyages to China, by the eastern route, he constructed three charts, one of the Strait of Macassar, another of the west side of the Philippine Islands, the third of the tract from Dampier Strait, through Pitt's Passage, towards Batavia, accompanied by a memoir of sailing directions, which were published under the patronage of the East India court of directors, for the use of their ships.

He finally returned to England in 1805, and soon after published a variety of charts,[*] with "Memoirs" of his voyages, to accompany them, explanatory of Indian navigation. Several of his papers, which he presented to Sir Joseph Banks, were published in the Philosophical Transactions for 1810, particularly some remarks on luminous animals; and some are published in Nicholson's Philosophical Journal, vols. 13, 14, and 15.

In 1809 he published "Directions for Sailing to and from the East Indies, China, New Holland, the Cape of Good Hope, and the interjacent ports." This invaluable work, which is now a standard authority, was compiled chiefly from original journals and observations made in the oriental seas, during twenty-one years. Its great utility and accuracy have been attested by the most competent witnesses in all parts of the world; and the author was almost a slave to it, devoting all his attention to correcting, revising, and enlarging it. He had just completed a new edition of this work prior to his death, all but the index. In 1810, on the death of Mr Dalrymple, he was appointed by the court of directors, hydrographer to the East India Company. From this time, all his energies were dedicated to the important duties of his office; and to the construction of a variety of valuable charts and works; amongst these are, an Atmospherical Register, for indicating storms at sea (1816); a new edition of "Mackenzie's Treatise on Marine Surveying (1819)," and the "East India Pilot." He also produced a paper, which was read before the royal society, on the Icebergs in the southern hemisphere, which is printed in the Philosophical Transactions for 1830.[†] His last work was a Chart of the East Coast of China (1835), a very curious and interesting one, from having the names in the Chinese character and in English, translated by himself.

Mr Horsburgh died on the 14th May, 1836. He was married in 1805, and left one son and two daughters. He was a man of modest and unobtrusive character; of the most benevolent disposition, and the strictest probity. He was devoted to those branches of science which belonged to his profession. To be useful to his fellow creatures seems to have been the impulse of all his labours; and the number of lives and the amount of property he has been the means of preserving is incalculable. A striking public acknowledgment of his merit is contained in the report of the select committee of the House of Commons, on shipwrecks, which refers to the highly valuable labours of the East India Company's maritime officers, and "the zealous perseverance and ability of their distinguished hydrographer, the late captain Horsburgh, whose directory and charts of the eastern seas have been invaluable safeguards to life and property in those regions."

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[*] A chart of the China Sea; a chart of the Straits of Malacca; a chart of the entrance of Singapore Strait: a chart of Bombay Harbour. He afterwards published a chart from lat. 38° S. to the equator, comprising the Cape of Good Hope, the east coast of Africa, the Madagascar, Archipelago, &c.; a chart of the Peninsula of Hindostan, the Chagos, Maldiva, and Lacca Diva Archipelagos, and Ceylon, and a small chart of the islands and channels between Lucconia and Formosa.

[†] In examining the journals of the East India Company for the whole of the previous century, captain Horsburgh found no account of icebergs seen in the southern hemisphere, though the vessels had proceeded into the parallels 40°, 41°, and 42° south; while, during the two years previous to 1830, icebergs had occasionally been met with by several vessels very near the Cape of Good Hope, between lat. 36° and 39°. The most remarkable instance adduced by captain Horsburgh is that in which the brig Eliza fell in with five icebergs, in 1828, lat. 37° 31′ S., lon. 18° 17′ E. of London. They were enormous masses of ice, from 250 to 300 feet high, of the shape of church steeples. He attributes their appearance to the existence of a large tract of land near the Antarctic circle, somewhere between the meridian of London and 20° east longitude: and their unprecedented descent during the two years in question, to their disruption from the place of their formation by the violent convulsion of an earthquake or volcano. He states it as a remarkable fact, that icebergs are met with at the same period of the year, April and May, whether in the northern or southern hemisphere, although the seasons are then, in each hemisphere, of an opposite character.

In person, Mr Horsburgh was of the middle size, athletic and well-proportioned; his complexion dark, his countenance mild, intelligent, and prepossessing; his manners were simple and unassuming.

HOWDEN; a market-town and parish in Howdenshire wapentake, in the East Riding of Yorkshire, twenty-one miles from York, and 180 from London. Population in 1841, 4860. The horse fair which is held here is one of the most celebrated in the kingdom, and is numerously attended. The steam-boats which pass and repass Howden many times a day, between Hull and Selby, offer convenient means of communication with Howden. Selby, which is only ten miles distant, places Leeds and the busy district around it in close contact with Howden. The steam-boats to Thorne render the communication with Sheffield nearly as rapid; and from Goole, which is so short a distance from Howden, there are steam-boats to Hamburgh, London, and Yarmouth.

The *wapentake of Howdenshire*, is bounded on the south by the river Ouse; but as the Trent joins that river nearly opposite the eastern limits of Howdenshire, the Humber forms its south-eastern boundary line. A very small part of Howdenshire is west of the river Derwent, and there are two small portions which are altogether detached, and are situated east of the wapentake, on the banks of the Humber. The population of the whole wapentake was 8,246 at the last census. The country is flat, and was formerly subject to frequent inundations.

The manor and *church of Howden*, or Hoveden, as it was anciently called, originally belonged to the abbey of Peterborough; but previous to the conquest, they had been wrested from that monastery, on account of its inability to pay the tax called *dane-gelt*, which was levied with such rigour, that those who failed in raising the required contribution forfeited their lands. This church and manor were in possession of the crown at the period of the conquest, and were given by the Norman monarch to the bishop of Durham, who obtained a confirmation of the grant from pope Gregory VII. The bishop vested the church in the monks of Durham, but retained the manor. Thus the prior and convent of Durham obtained ecclesiastical jurisdiction in Howdenshire. The collegiate church of Howden was dissolved in the first year of Edward VI., and the temporalities thereby became invested in the crown. Thus they remained till 1582, when queen Elizabeth granted them by letters patent to Edward Frost and John Walker, their heirs and assigns for ever. The tithes are now in the hands of several impropriators. Towards the close of the sixteenth century, the church of Howden fell into decay. The choir becoming altogether unsafe, the parishioners, in 1634 and 1636, fitted up the nave for the celebration of public worship. In 1696 the groined roof fell in, and from that time the east end has been but a venerable memorial of its former magnificence. The church is built in the form of a cross, with a square tower, 135 feet in height. The chapter house was formerly the most celebrated portion of the edifice. It was built in the thirteenth century, and contained thirty stalls, each under a gothic arch, separated by clustered pilasters, very small, and of delicate form, having foliated capitals of pierced work, from which rich tabernacle work rose, and formed a canopy for each stall. The tower of the chapter-house fell in 1750. The whole length of the church, including the ruins, is 255 feet, and the breadth sixty-six feet. The length of the choir is 120 feet, and of the nave 105 feet, and the breadth of each is sixty-six feet. Nearly close to the church the bishops of Durham had an ancient palace, which was their frequent summer residence. A park extended from it to the Ouse, distant about a mile. The ruins of this ancient edifice have been occupied as a farm-house.

HOWE, JAMES; an eminent painter of animals, was born in the parish of Skirling, in the county of Peebles, Scotland, on the 30th August, 1780. His father was minister of the parish, but being in humble circumstances, James received only such elementary instruction as the parish school could supply, and having early displayed a taste for drawing, he was sent, at the age of thirteen, to Edinburgh, in order that he might learn the trade of house-painting. Even when an apprentice, he became known for his peculiar talent, and, among other jobs, was employed, during his spare hours, to paint for Marshall's panoramic exhibitions, at the rate of five shillings an hour. On the expiration of his apprenticeship he commenced business on his own account as animal painter, in Greenside street, where he attracted the notice of various persons of distinction, and among others, the earl of Buchan, by whom he was induced to pay a visit to London, with the view of taking portraits of some horses in the royal stud, and of thus securing the highest patronage in the realm. Howe accordingly painted likenesses of some of these in his very best style, but it unfortunately happened that George III. was at this period seized with blindness, and could not appreciate the painter's power. Howe was in consequence obliged to return to Scotland, and throw himself on his old patrons. For a number of years, Howe continued to hold the rank of the first animal-painter in Scotland, if not in Britain. His cattle-portraits and pieces found their way into the houses of many of the nobility and gentry of the country. Some little time subsequent to 1810, Sir John Sinclair gave him a commission to travel through various parts of Scotland, for the purpose of painting the different breeds of cattle to be found in the country. A series of valuable pictures was the result of this journey, most of which are still in the possession of Sir John's family. The faithfulness of these delineations rendered them of much use to Sir John in the composition of his agricultural works. Various of Howe's paintings of this date were engraved, and it was in this form that the public chiefly became acquainted with them. One piece, for example, engraved by the famous artist Turner, still keeps possession of the print-shops. It represents a Hawking Party, and contains figures of men and horses, as well as of hawks. The most striking feature of this and the works previously mentioned, was the *character* which Howe threw into his delineations of animals. Every individual animal in his pieces, even though the group might be numerous, was seized and represented in some attitude or movement, characteristic of the race, or of the breed—for even *breeds* are distinguished from one another by such peculiarities. In this lay his great art and merit; and hence the fidelity of his paintings is always to be recognised at a glance; for, though few people, perhaps, could describe any creature's characteristic attitudes, if asked to do so, almost every one can distinguish the verisimilitude of such peculiarities, when set before him by the pencil. However, having once succeeded in giving *character* of this kind to his representations of animals, he was too apt to rest contented there, and to neglect or slur over the *finishing*.

After the battle of Waterloo, Howe was induced to visit the scene of action, and returning home, he completed a large panoramic view of the contest, in one month, although he had four thousand feet of canvas to cover with men and horses. The panorama was highly successful both in Edinburgh and Glasgow, drawing for a long period thirty pounds a-night, half of which fell to the painter's share. Howe resided about two years in Glasgow at this period, in circumstances which were always fatal to his best interests. He was idle, had plenty of money, and was greatly deficient of that useful element of character, usually termed *steadiness*. The consequence was, that he became a dupe to all who chose to prey upon his simplicity, and indulged in a continued round of dissipation. At the close of the term mentioned, he returned to Edinburgh, sunk in spirits, injured in constitution, and without a penny in his purse.

Fortunately at this time he was invited by the Hon. Mr Maule to Brechin castle, to paint some pieces there. The invitation was accepted, happily for the artist, because the quiet of a country residence partly restored the health that had been dissipated. After a stay of four months, during which time he adorned the walls of Brechin castle with various proofs of his genius, Howe returned to Edinburgh master of several hundred pounds, which he lodged in one of the banks—the first money of his so placed. He now began to work diligently, and to show something like a firm resolution to avoid his late errors; but his better genius did not long retain the ascendancy, and before the close of 1821, he was under the necessity of removing his lodgings to Newhaven, in the hope that the change of air might benefit his again weakened frame, as well as that the seclusion of the place might be productive otherwise of good. He resided here with a respectable private family, and was soon able to resume his professional avocations. A number of large compositions, many hundred sketches of an unique character, and countless portraits of single animals, were produced by him during the next few years, being executed partly at the request of employers, and partly at the instigation of his own fancy. His wonderful skill in depicting animals remained undiminished by time, though he grew always more and more careless as to the proper completion of his pieces. So universally admitted were his powers, that the most celebrated artists of the day not unfrequently made use of his talents in filling in cattle into their best productions. During the years which he spent at Newhaven, he entered on a task which, if completed, would have proved a lasting benefit to his country, as well as a durable memorial of his own genius. This was a work on British Domestic Animals, of which Howe was the painter, and Lizars the engraver. Several numbers were published, containing pictures of cattle of various kinds and breeds, besides horses, cows, sheep, &c. Unfortunately, the work did not succeed, and was accordingly abandoned. The latter years of Howe's life were spent in Edinburgh. In 1834, he took up his residence with an old pupil of his own, Mr Robertson, with whom he remained till the period immediately preceding his death, which event took place on the 11th July, 1836.

HUME, David, baron of the exchequer in Scotland, and nephew of the illustrious historian, was born in 1756, and died at his house, Moray Place, Edinburgh, Aug. 30, 1838. He filled various important situations with great ability, having been successively sheriff of Berwickshire and of West Lothian, professor of Scotch law in the university of Edinburgh, and one of the barons of exchequer, which latter office he held till the abolition of the court in 1830. But his most important service, and that which will render his name coeval with the criminal jurisprudence of his country, is his great work on the Criminal Law of Scotland, which has long been considered as the text-book in that department of jurisprudence, and is constantly referred to as authority both by the bench and the bar. It was published in two vols. quarto, under the title of "Commentaries on the Law of Scotland, respecting the description and punishment of Crimes." Baron Hume left in the hands of the secretary of the royal society of Edinburgh, a valuable collection of MSS. and letters belonging or relating to his celebrated uncle.

HUNT, Henry, late M. P. for Preston; a well-known popular orator among the early radicals, was born at Widdington Farm, in the parish of Uphaven, Wiltshire. For many years he regularly attended Devizes Market, seldom, if ever, missing a market day. After his father's death he was elected chairman of the table in the principal dining-room of the farmers at the Bear inn; the daughter of the landlord of which inn, Miss Halcomb, he married. Though fond of pleasure, no man attended more strictly to his farming business, and the farms of no man in the kingdom were managed better, or were in higher condition. He had also the best flock of Southdown sheep in the county, the wool of which sold for the very highest prices. In the year 1801, when the apprehension of an invasion was so great that the lord lieutenant of the county caused letters to be written to the churchwardens, requiring from every parish a return of all movable property, live and dead stock, &c., in Mr Hunt's schedule were enumerated—wheat, 1,600 sacks; barley, 1,500 quarters; oats, 400 quarters; hay, 250 tons; cart horses, 30, value from 30 to 70 guineas each; working oxen, 10; cows, 20; sheep, 4,200, &c.; altogether valued at upwards of £20,000.; the whole of which he voluntarily tendered to the government, to be at their disposal in case of an invasion. He also engaged to enter himself and three servants, completely equipped, and mounted upon valuable hunters, as volunteers, into the regiment of horse that should make the first charge upon the enemy. This liberal and patriotic offer was talked of all over the country, and he received the thanks of the lord lieutenant. The years 1801 and 1802 may be said to have been the zenith of the farmer's glory: wheat being at this time £4 a sack. Although Hunt generally drove four-in-hand to Devizes market, he was able to do a day's work with any labourer in the county; and several anecdotes are related of the "labours" of this modern Hercules.

Hunt was a member of the yeomanry cavalry; but in consequence of some misunderstanding he received a letter from lord Bruce, saying, "that his services were no longer required in the Marlborough troop, and requesting that he would return his sword and pistols, by the bearer." Hunt went to lord Bruce, and demanded satisfaction. For this offence he was indicted in the court of King's bench, found guilty, and sentenced to pay a fine of £100 and to be imprisoned for six weeks. In prison he met with Waddington and some other Radicals, to which may be attributed his subsequent political sentiments. It was in Bristol, where he was following the trade of a brewer, that he made his debut as a candidate for parliamentary honours. In June 1812, a vacancy having occurred in the representation of that town, the candidates proposed were, R. H. Davis, Esq., Mr Hunt, and Mr Cobbett. The poll was kept open for fourteen days, at an enormous expense to Mr Davis. Serious riots took place, and the city was for a time at the mercy of a lawless mob. The numbers polled were, for Mr Davis, 2142, Mr Hunt, 235, Mr Cobbett, 0. Parliament being dissolved in the following October, Mr Hunt again offered himself in opposition to Mr Davis, Mr Protheroe, and Sir Samuel Romilly; and he was again beaten by a large majority, Mr Davis and Mr Protheroe being the members returned. Hunt twice contested the county of Somerset without success, and also made several fruitless attempts to interest the electors of Westminster in his favour. Although as a mob orator his popularity was unrivalled, and his out-door triumphs were hailed by assembled thousands, as at Manchester and Spa Fields, yet he had perhaps no serious hope of ever becoming a British senator. At length, however, during the excitement of the Reform Bill in 1830, he defeated lord Stanley at Preston, and entered the House of Commons, where, like other noisy demagogues, he soon found his level, and became harmless and insignificant, except in his votes. In personal appearance he was perhaps one of the finest men in the House: tall, muscular, with a healthful sun-tinged florid complexion, and a manly deportment—half yeoman, half sportsman. To a close observer, however, his features were wanting in energy of will and fixedness of purpose; the brow was weak, the eyes were flittering and restless, and the mouth was usually garnished with a cold simper, not altogether accordant with that heart-born enthusiasm which precludes all doubt of sincerity. If to this defect we add, that he was a man of very imperfect education, possessing but little information, and that all on one side, on the subjects he talked most about, and that readiness was the chief characteristic of his understanding, it will not be judging uncharitably to say, that a restless thirst of excitement, great personal vanity, and the accident of circumstances, and not native force of intellect, achieved for him his "Radical notoriety." He was re-elected in 1831; but in the following year the Derby interest resumed its sway at Preston. He died on the 13th Feb. 1835, aged sixty-two.

HUNTINGDON; the county town of Huntingdonshire, is situated on a rising ground to the north of the river Ouse, fifty-eight miles N. by W. from London. It was called in Saxon, Huntingadun, or Hunters' down, from the nature of the surrounding country, as adapted for the chase. It was a place of some importance in the reign of Edward the Elder, who is said to have erected a castle here, in 917, which was enlarged and strengthened with new buildings and ramparts, by David, king of Scotland, and earl of Huntingdon, in the reign of Stephen; but was afterwards demolished by order of Henry II. At the period of the Norman Conquest, here was a mint, for coinage; and Matilda, the wife of William I., founded a monastery at this place, which must have been anciently much more extensive than it is at present, as there were fifteen churches, which in Camden's time were reduced to four, and at present there are only two. The town consists principally of one street, extending north westward from the banks of the Ouse, about a mile in length. The brewing-trade is carried on here, and the principal commerce is in corn, flour and malt. The borough comprises the parishes of All Saints, St Benedict, St John the Baptist, and St Mary, all in the diocese of Lincoln. Oliver Cromwell was born in the parish of St John the Baptist, April 25, 1599. Population of Huntingdon in 1841, 5,500.

HUNTINGDONSHIRE; an inland county of England, twenty-four miles in length, eighteen in breadth, and sixty-seven in circumference. It is almost surrounded by the counties of Cambridge and Northampton. It is included in the diocese of Lincoln and province of Canterbury. Its chief rivers are the Ouse and the Nen. The Ouse rises at Brackley, in Northamptonshire, and enters this county at St Neots; the Nen has its source near Daventry, flows by Oundle, and fills the several Meres. Huntingdonshire is divided into four hundreds, in which are six market-towns, namely, Huntingdon, St Ives, Kimbolton, Ramsey, St Neots, and Yaxley. The air is generally good, except the fenny tracts, which are frequently subject to unwholesome damps. The chief products are, corn, fine horned cattle, and a very rich and delicate kind of cheese, which is made in the neighbourhood of Stilton, where it is usually sold, hence it is called Stilton cheese. Huntingdonshire, for the most part, is a farming county, and produces no manufacture worthy of notice.

When the Normans became masters of England, William the Conqueror, in 1068, gave the earldom of this county to Waltheof, a noble Saxon, on whom he also bestowed the hand of his niece, Judith; but that lady betrayed her husband, who was executed for a treasonable conspiracy against the government. David, prince of Scotland, having married the heiress of Waltheof, was made earl of Huntingdon in 1108, and the honour continued in his family till 1219. Almost the whole county is said to have been forest land till the reign of Henry II.; but it is now open and well cultivated. Population of the county in 1801, 37,568; in 1841, 58,549. Population of the chief towns of the county: Huntingdon, 5,500; St Ives, 3,514; St Neots, 3,123; Kimbolton, 1,634; Ramsey, and parish, 3,680; Yaxley, 1,211.

HUNTINGFORD, George Isaac, lord bishop of Hereford, and Warden of Winchester college, was born at Winchester, September 9th, 1748. He was admitted on the foundation at Winchester college in 1762; and, in 1768, was elected to new college, Oxford; where he attained the degree of M.A. in 1776. In 1772, on the death of his brother, the Rev. Thomas Huntingford, he succeeded him in the mastership of Warminster school; and continued there for some years. In 1781, he first confided himself to the press, in a private edition of fifty copies of some Greek monostrophic odes. These compositions, not only exhibited his knowledge of the beautiful language in which they are written, but ranked him high as a man of poetical genius. In the following year they were printed by Mr Nichols, at the expense of Mr Burdon, the bookseller at Winchester. They were reviewed in the Monthly Review, by Dr Charles Burney; who, with some warm and well-deserved compliments, combined a series of elaborate remarks on some supposed lapses of correctness, which were afterwards defended in an "Apology" annexed to a second collection, published in 1784. A "Translation of Huntingford's First Collection of Monostrophics," by the Rev. P. Smyth, was printed in 1785. In 1782, Mr Huntingford published the first part of his "Introduction to the Writing of Greek, after the manner of Clarke's Introduction to Latin." This work has been adopted in the higher forms of almost all the classical schools in the kingdom. The second part, consisting of select sentences from Xenophon, is now united to it. He also published, in 1788, "Ethic Sentences, by writing of which Boys may become accustomed to the Greek Characters." Another classical work was a Latin interpretation of Ælian. In 1785, he was chosen a Fellow of Winchester college. In 1789, he published a sermon preached in the cathedral church of Salisbury, at the triennial visitation of the lord bishop. In the same year he was appointed Warden of Winchester college; and in 1793, he accumulated the degrees of B. and D.D. In the latter year he published a sermon preached before the House of Commons; in 1795 and 1797, two volumes, each containing twelve discourses; and in the last-named year, also, a discourse preached before the Hampshire Fawley volunteers. In 1800, he published "A Call for Union with the Established Church, addressed to English Protestants; being a Compilation of Passages from various Authors" (reprinted in 1808). It was dedicated to Mr Speaker Addington, who had been his pupil at Winchester; and who, after becoming prime minister, in the following year, advanced him to the bishopric of Gloucester. From Gloucester, Dr Huntingford, after he had previously declined translation, was, in 1815, promoted to the See of Hereford. His publications, whilst on the bench, were almost entirely professional: their titles are as follows:—"A Sermon for the Royal Humane Society, at St James's," 1803, 8vo.; "Thoughts on the Trinity," 1804, 8vo.; "A Sermon before the House of Lords," May 25, 1804, 4to.; "A Sermon at St Martin's-in-the-Fields, before the Governors of the Benevolent Institution for delivering poor Married Women," March 9, 1806, 4to.; "Preparation for the Holy Order of Deacons, or the first Question proposed to Candidates for the Holy Order of Deacons elucidated, a Charge," 1807; "Preparation for the Holy Order of Priests, or the Words of Ordination and Absolution explained, a Charge," 1809; "The Petition of the English Roman Catholics considered, in a Charge delivered at his Triennial Visitation in 1810;" "A Protestant Letter, addressed to the Right Hon. Lord Somers," 1813, 8vo. The bishop died, unmarried, on the 29th April, 1832, leaving a high character as a scholar and a man of worth.

HYDRATE; a term used in chemistry to designate a definite compound of water. Thus, caustic potash is composed of dry potash KO, and water HO, and is called the hydrate of potash. Slaked lime is a compound of lime with water, a hydrate of lime. Oil of vitriol is a hydrate of sulphuric acid, or a compound of the dry acid with water. Alcohol is a hydrate of ether, &c., &c. Many metallic oxides, when precipitated, combine with water, and form solid hydrates. Peroxide of iron and alumina, for example, when precipitated, contain twenty-five or twenty-six equivalents of water for one of the dry oxide.

HYDRIODIC ACID; a powerful acid gas, composed of iodine and hydrogen. It is very analogous to hydrochloric or muriatic acid gas, from which it is distinguished by containing iodine instead of chlorine.

HYDROBROMIC ACID; an acid gas analogous to the preceding, and to the following; composed of bromine and hydrogen.

HYDROCHLORIC ACID; the systematic name of the acid, long known as muriatic acid, or spirit of salt. It is composed of chlorine and hydrogen, and is the type of the class of hydracids. When these acids are placed in contact with metallic oxides, they do not combine with them, but mutual decomposition occurs, the hydrogen of the acid uniting with the oxygen of the oxide to form water, while the metal combines with the radical of the acid to form a salt. Thus, when hydrochloric acid, (Cl H) acts in oxide of silver (Ag O) there are formed water (HO) and chloride of silver, (Ag Cl). See *Muriatic Acid.*

HYDROCYANIC ACID; a hydracid, composed of cyanogen and hydrogen. It has long been known as prussic acid. It is a most virulent poison, acting, in a full dose, with greater rapidity than any other poison known to physiologists. Of the pure acid one or two drops will cause death in a few seconds, if introduced into the mouth of a large animal. When a dose insufficient to cause instant death has been administered, the proper antidotes are ammonia, chlorine, and the cold affusion, which sometimes prove effectual after life appears extinct. See *Prussic Acid.*

HYOSCYAMINE; a vegetable alkali, extracted from the hyoscyamus niger, or henbane, by Geiger and Hesse. It is liquid, volatile, has a strong narcotic odour, like oil of tobacco, dilates the pupil powerfully, and is a virulent narcotic poison.

HYPOCHONDRIASIS AND HYSTERIA, (*a.*) Among the parts of medical study which would seem particularly to recommend themselves to general readers, we should be disposed to place that melancholy malady to which physicians give the name of *hypochondriasis;* and that changeful disorder which vexes the female constitution, and baffles the medical practitioner, under the comprehensive appellation of *hysteria.* Both these affections, whilst they grievously disturb the body, either take their origin, or derive aggravation from, or induce, in different examples, great disturbance or impairment of mind; insomuch that the most zealous writer of prescriptions can hardly promise deliverance from either disease, unaided by some general mental regimen. Although the identity of these diseases has been maintained by many authors, there is not only, in the symptoms, the causes, and the treatment of the maladies, little like an approach to identity, but there actually appears to be no kind of resemblance. In the symptoms of the two disorders especially, there is little or nothing in common. Hysterical patients may indeed be hypochondrical, and hypochondriacs may be hysterical; but the mobility, the superexcitability of the hysteric constitution is still broadly distinguished from the dull mono-maniacal fancies of the hypochondrical temperament. Hysteria seldom appears in men; hypochondriasis much more frequently in men than in women. Hysteria is a disease of the weak, the restless, the excitable; hypochondriasis, of the sedate and contemplative. Hysteria is often linked with inordinate passions, and fostered by luxury; hypochondriasis assails those whose minds, after being severely bent to one pursuit, are allowed to fall into relaxation and comparative indolence. Whatever exalts the sensibility, as poetry, music, the fine arts, may dispose to hysteria; but in many of these things the harassed hypochondriac finds temporary relief. Hypochondriasis affects the retired man of business, the disbanded soldier, the sailor paid off; hysteria affects young females, commonly in the prime of life, and whose profoundest application is to the perusal of the newest romance.

A comfortable looking gentleman, of easy fortune, whose house, whose equipage, whose dinners, whose general condition, seem calculated to excite the envy of his toiling neighbours, begins, about the age of forty-five, or fifty, to lose his cheerfulness, to forego his customary exercises, to make his diet a subject of careful study, to regard with especial dislike any wind that approaches within a few points of the east, and to clothe himself in superabundant raiment. His conversation has undergone a change. From discourse relating to the sports of the field, or grave discussions of the corn laws and currency question, he perpetually deviates to the subject of his own health. He eats well three times a day, but complains of loss of appetite. He looks smooth and ruddy, but tells you that he loses flesh daily. His countenance assumes a melancholy cast, and all his meditations tend towards the subject of his digestive organs. He acquires an unhappy habit of feeling his own pulse, and he often walks to the looking-glass to inspect his tongue. He is very particular in the matter of his excretions, keeps a journal of his symptoms and feelings, and weighs himself once a week. There is nothing of which he is more convinced than that by his sensations he can trace his food through all the curves of his bowels down to one particular point, where he strongly suspects the intestinal canal ends in something very much like a *cul-de-sac*. If this unfortunate gentleman is blest with an apothecary largely endowed with the gift of listening to him the patient unfolds a tale of sufferings various and distressing: all his sensations, perverted from their proper ends, seem to have become the instruments of annoyance. All the powers of language are employed to describe the various perplexities which wait upon the functions of digestion and assimilation; the stomach has no capacity for suffering which is not called into activity; it is craving or vexed with nausea; it is distended, overloaded, aching, gnawing, burning, and drawn up with spasms; whilst the sympathetic intestines are seized with sudden pains and indescribable griefs, which lead the sufferer at length to believe that every viscus in his body is turned upside down. Every particular connected with the supposed history of his case seems to him worth preserving. It may be that the alterative pills of the excellent apothecary, and his infallible black draught, fail to give relief. But kind friends and neighbours, overflowing with compassion, fill the house with medicines of their own recommendation, and which are spoken very highly of in advertisements. Some of these are rather violent, and bring the patient to so faint a condition that he passes quickly to the other stages of a disorder which is now advanced to a very promising hypochondriasis. The patient then, perhaps, experiences a division of his pains, without much diminution of them. No longer concentrated on the first passages, they are dispersed over the whole economy. Wherever, in the universal frame of his body, there is a nerve or a blood-vessel, there is there also some uneasy irregularity. His head alone is affected with as many maladies as would fill an hospital. Flashes of light affect his eyes; the noise of waters is in his ears; stabs of pain affect his temples; invisible bonds bind his aching brow; upon the vertex sits a load heavier than that carried by the strongest porter; the foot of a giant presses on his neck and shoulders. In these sensations there is frequent variety, but rare relief. All at once loud bells ring within the chambers of the inner ear; or the sound of artillery, or voices as of a multitude, break in upon the silence of the hypochondriac's parlour. Then his eyes become fantastically affected; the landscape is enveloped in smoke; the columns of the morning paper move *en echellon;* the patient is quite convinced that he is growing blind. It is incredible how much he suffers from the noise of children; the servants shut the doors with a violence that distracts him; and all his friends have acquired an unaccountable trick of talking loud.

In all this, although its detail conveys even to the most compassionate hearer an idea of fancy and exaggeration, there is much real and pitiable suffering. Yet this is but a part of the woes of a hypochondriac. His very heart does not beat as it used to beat: it throbs, and jumps, and flutters, and sometimes seems to come to a complete standstill. When he lies on his left side, it knocks against his ribs as if it would come out of his thorax; and when he turns for relief to his right, the heart turns too, and keeps up the same disturbance. Then every particle of his skin has acquired an intensity of feeling; a current of air, an open door, torments him; the halo of fresh atmosphere which comes into his close room with friends who have been riding or walking out of doors feels raw and irritating to his organs of respiration, and chills his blood. Easy chair, or comfortable sofa, he can find none. He loads himself with under-waistcoats of all denominations, and in numbers without number. He cannot always open his mouth with impunity, for the fog penetrates to his stomach and refrigerates the vital organs, so that he does not recover it for the whole day.

The mind, which has not been quite free from impairment from the first, now becomes more gravely affected. Reading and all mental occupations become irksome; every view of the past is tinctured with sadness; the future prospect is without hope; and the fear of death is for ever impending.

> "The sun grows pale;
> A mournful visionary light o'erspreads
> The cheerful face of nature: earth becomes
> A dreary desert, and heaven frowns above."

Strange fancies introduce themselves among the sufferer's thoughts. Sometimes he supposes himself to be expanded like a balloon, and his specific gravity diminished, so that he dreads an involuntary ascent to the stars. Or his solid bulk is imagined to be so enlarged that it perplexes him to think how he shall get through the door. Certain untrue sensations in the lower limbs persuade him that they are made of glass; or his perceptions are so compressed that he conceives himself to be a piece of money. He often thinks himself dying, and is occasionally satisfied that he is dead.

Such is the disorder which medical writers call hypochondriasis. It happens, oddly enough, that the very errors of the faculty not unfrequently produce a great deal of comfort to persons labouring under this disorder. Well persuaded themselves that they labour under many grievous diseases, of which some one is the chief, they are never so happy as when they meet with a medical practitioner who, either in his innocence or artfully, fixes boldly on some organ as the fountain and origin of all the patient's symptoms. The patient tells his friends, with the air of a man comfortably relieved from every doubt, that his new doctor has found out his complaint, and that he has got a disease of the mesenteric glands, or a scirrhus of the bowels, or a softening of the brain. He now knows what he is about, and can pursue a regular plan; which he does until he removes to some other fashionable resort of the sick,—calls in another doctor, and finds out they were quite mistaken at Bath and Cheltenham, and that he labours under some other malady, but quite as incurable. In the mean time, the worst part of the case is, that there is probably some real disorder at the bottom of all these complaints, and which requires for its detection and management a rarer sagacity and a more skilful application of medicine than is to be expected from those who are the readiest to prey upon the weakness and credulity of hypochondriac patients.

By writers in general, hypochondriasis has been considered as particularly common in England. Admitting the fact, its explanation is not, we apprehend, to be sought solely in our variable climate. The frequent gloominess of our sky, which has been accused of "disposing all hearts to sadness," is more than compensated for by its enlivening mutability; and those who, ungrateful for the gorgeous springs, the cool refreshing autumns, and summers not intolerable, of our climate, have sung the praises of warmer regions and a cloudless sky, have in most instances had no opportunity of making a comparison between the climate of England and that of the over-rated South of Europe. Certainly, hypochondriac maladies seem most to affect the north-west portions of Europe; but the cause is perhaps to be found in the greater mental activity, enterprise, and exposure to all the reverses and fluctuations of fortune, which belong to the state of society in these countries.

Among trades, weavers and tailors are great hypochondriacs; but shoemakers seem to be in this respect pre-eminently wretched. Zimmerman pointed out this fact, and ample experience has verified it. Seated all day on a low seat; pressing obdurate last and leather against the epigastrium; dragging reluctant thread into hard and durable stitches; or hammering heels and toes with much monotony; the cobler's mind, regardless of the proverb, wanders into regions metaphysical and political and theological; and from men thus employed have sprung many founders of sects, religious reformers, gloomy politicians, "bards, sophists, statesmen," and all other "unquiet things," including a countless host of hypochondriacs. The dark and pensive aspect of shoemakers in general is matter of common observation. It is but justice to them, however, to say, that their acquisitions of knowledge and their habits of reflection are often such as to command admiration. The hypochondrical cast of their minds is probably in part induced by the imperfect action of the stomach, liver, and intestines, in consequence of the position in which they usually sit at work. General readers may be glad to be informed that the regions under the short ribs on each side are called by anatomists the *hypochondria*, and that in these regions are lodged some of the most important organs of digestion, from a supposed impairment of which the hypochondrical malady gained its appellation. It has also been called the English malady, and the *Spleen*, from its imaginary connection with a disease of that organ, which does not seem to be verified by experience.

The most interesting and the most melancholy hypochondriacs are to be found among men of cultivated minds and sedentary habits, whose sufferings appear but little in their works. Many a page, which has made a thousand readers gay, has been written in all the misery of hypochondriasis; and some of the finest productions of literature have been produced at the price of an affliction which seems to embody every other form of affliction. On persons of this kind, both the mental and the bodily causes of hypochondriasis are accumulated. Neglect of exercise is combined with frequent mental excitement, and a constitution of peculiar sensibility is exposed to all the trials incidental to men of little worldly wisdom and small possessions. Depressing circumstances, a jaded mind, a feeble body, and rebellious digestive organs, thus conspire to call up all the demons of hypochondriasis and of melancholy, and the days of the unhappy victim become pretty equally divided between mental brilliancy and a state bordering on moody madness.

There are not many maladies of which the early and proper treatment is more important than hypochondriasis. Habit daily adds to the mental part of the disorder; the corporeal derangements, whether primary or secondary, become inveterate by delay; the continual attention to sensations heightens their force, and seems to impart an activity to the extreme nervous branches, or in some other way so to disturb both them and the small blood-vessels, as actually to cause the supervention of disorders, of which a long dread has been entertained. The illustrious Laennec was of opinion that long continued mental depression favoured the development of pulmonary consumption; and an apprehension of the occurrence of cancer has often been thought to dispose to cancer. But if these terrible consequences should not follow, the condition of the hypochondriac is yet exceedingly to be pitied. He is disqualified from many or all of the duties of life; his temper yields to continual irritations; his mind becomes weak and habitually directed to trifles; his feelings become selfish and contemptible; and his life is little better than a long disease.

The treatment must necessarily be partly mental, and partly directed to the regulation of the disordered bodily functions. To restore the proper condition of the stomach, the liver, the duodenum, or some other portion of the intestines, may require a skilful physician, and varied means; only applicable by those whom experience has taught to adapt general principles to individual examples. Whatever medicines are given, it will generally be found serviceable to combine with them some form of bathing. Early hours of going to bed and rising; a careful avoidance of great irregularities in living, which are of all things the most surely paid for by fits of despondency; an agreeable course of reading; much exercise in the open air; cheerful society whenever society is not more irksome than silence and retirement; a moderate pursuit of field-sports; but, above all things, when it is practicable, a frequent change of residence;—all these things may be looked upon as important parts of the treatment.

The proper regulation of the diet is very material; and it will be happy for the hypochondriac if, amidst the fancies and the follies of medical authorities on this particular point, he can elicit from his adviser some rules which are not utterly irrational. In general, we apprehend that the *quantity* of food taken, and the times at which it is taken, demand more attention than the *quality* or nature of the food. Particular cases will suggest particular precautions; but what is commonly called living by rule is certainly not the rule of health. With a few exceptions, we would rather recommend the invalid to peruse lord Bacon's short Essay on the Regimen of Health than all the books on diet that were ever compiled.

Of the importance of a proper regimen of the *mind* in this unfortunate malady, too much cannot be said. In some unhappy cases the mind is from the first too much diseased to permit the establishment of such regimen, and, as in the case of Cowper, the prospect is truly cheerless. But in many cases the efforts of the patient may be successfully roused. A journey, a new study or pursuit, frequent rides on horseback, or any thing which effects a complete diversion of the thoughts, is most expedient; and contrivances apparently slight are sometimes rewarded by great results. The patient has, in favourable cases, sufficient power left to abstract his attention from the subject of his own health, and from medical reading, if strongly impressed with the danger of pursuing such trains of thought: and when exhorted to change his diet or regimen, to take exercise, or make any other effort, he may truly be encouraged with the assurance that if he

> "Throw but a stone, the giant dies."

Such are some of the principal circumstances worthy of observation in hypochondriasis, a disease which, although it sometimes attacks women, is much more common, as a consideration of its causes might lead us to expect, in men; and one of the worst of woes of that period of life when the activity of youth is gone and the characteristic serenity of age is not yet attained. There is no time in a man's life in which the management of the mind is more important than in this; as, without care and due precaution, it may prove to be a period of discontent, of unhappiness, and even of imprudencies and rashness, for which there is no longer the excuse of youth and inexperience.

Hysteria, or hysterical disorder, is, as we have already remarked, not the disorder of middle aged gentlemen, but of young women, for the most part of delicate frame, highly susceptible nerves, indolent habits, and minds less carefully regulated than would be desirable. It is, however, sometimes the affliction of older females, females of middle age, and occasioned by derangements of the health which especially disorder the nervous system. In most of its forms it is a very troublesome malady, and difficult of cure. Yet so much may be done, by a careful attention to the general regimen of young women, to lessen the extreme susceptibility of the nervous system, that hysteria deserves quite as much attention as hypochondriasis.

The slighter indications of the hysteric temperament generally become observable in young women after they have attained the age of fourteen or fifteen, and consist of an increased sensibility to all causes, however trifling, of a nature to produce pleasure or chagrin. After a few years, if the habit of giving way to every emotion is not checked, and if any circumstances happen which are of a nature to disturb the affections, the more marked features of the disorder called hysterical are wont to appear; such as immoderate fits of crying or of laughing, easily induced, and very irregular spirits. At length, on the occurrence of something which causes either great disappointment or unusual sensations of pleasure, or after the excitement of animated society, or after dissipation and fatigue, the young lady has what is known to be an hysteric fit. She bursts into tears, and sobs violently, and for a long time, and as if she would inevitably be choked; or, being moved to laughter, she continues laughing so loudly and so long as to alarm the bystanders. Perhaps she falls down, or sinks into a chair, quite exhausted. Her face is red, her eyes are closed, and the eyelids are tremulous; the mouth is often firmly shut. It is perceived that the heart palpitates violently, and the arteries in the neck pulsate strongly. The breathing is variously affected; very often there is an evident constriction of the throat, and the patient forcibly applies her hands as if to remove it; sometimes the respiration is profound and tranquil, sometimes short and hurried. In some cases the hysteric person lies composed and quiet, but very often the hands and arms are violently thrown about, or the hands are strongly pressed upon the stomach, as if for the relief of violent pain; in some instances the trunk of the body is contorted, and occasionally the convulsive movements are more general and not easily controlled. Such an attack may last a quarter of an hour, or an hour, or even many hours, and may leave the patient uncomfortable, affected with headach, and feeling pain in the throat, and in those muscles which have been in strong action during the fit. Her own account of the fit commonly is, that she perceived a sensation as of a round ball in some part of the bowels, which seemed gradually to ascend until it reached the upper part of the throat, and then to remain, pressing upon the windpipe until she thought she should be suffocated. Although there has been such loss of control over the voluntary muscles during the fit, and such irregularity in their action, it will not be found that the patient has always been deprived of consciousness of what was taking place around her; she has perhaps heard all that was said, and known all that was done, although quite without the power to speak, or to give any indication of her own feelings or wishes.

One of the most singular characteristics of the hysterical disorder is, that in individuals liable to attacks of the above description, or any modification of them, (for the forms of the paroxysm itself are very variable), there is often a resemblance or simulation of various other maladies. There would appear to be some unusual condition of all the nerves of the body, productive, according to various accidental circumstances, of the signs of disease in the various parts which they supply, although such diseases do not in reality exist. Medical practitioners learn to recognize these spurious maladies, which quite impose upon common observers. A patient is thought to be suddenly and violently attacked with inflammation of the brain, or of the bowels, or of the lungs; or, some previous disease actually existing, certain symptoms are superadded, which make the case unlike any that are ever found in systematic descriptions of disease. Even in the course of a fever, a disease which seldom fails to excite the practitioner's anxiety, he is liable to be surprised, when the subjects of them are hysterical by constitution, by such strange accidents as but for that explanation would be either unintelligible or would mislead him into very erroneous practice. The diagnosis, consequently, or detection of hysteria, in all its possible forms and combinations, is a very important study to the physician; and a thorough acquaintance with its mutable character, and its property of mixing itself up with other maladies, sometimes enables him to tranquillize the fears which such odd combinations of disorder are well calculated to excite in the patient's friends and relations.

Among the many troublesome accompaniments or parts of hysteria, may be mentioned a particularly distressing cough, of a distinct and marked character. All coughs derive some modification from the cause in which they originate. The cough of a common cold differs from the deep hollow cough of consumption, and both are distinct from the hoarse cough which generally attends or precedes the measles. The cough or hooping-cough is distinct from all. But the cough of hysteria is not less peculiar; it is commonly loud, short, and repeated; dry and hard, and shaking the whole frame; induced and prolonged by all kinds of mental irritation, and quite refractory under common demulcent and anodyne treatment. It is sometimes periodical, and dependent on temporary causes; but often permanent, or at least not removed until by general means the patient's health and strength undergo great improvement. In some patients it puts on the character of croup, and in others of asthma; still, however, in most cases, only admitting of abatement by means directed to the general improvement of the constitution.

Imitating almost every disease, hysteria occasionally puts on many of the signs of approaching death. The pulse sinks until it can hardly be felt; the hands and feet become cold; the patient breathes with difficulty, and feels convinced that nothing can save her; and these very distressing symptoms and sensations may last for many hours; may return on many successive days, and yield at last, leaving the patient quite well. Such things happening to persons in the prime of life, their blooming appearance some weeks after recovery is often remarkably contrasted with the gloomy circumstances by which they were surrounded when the attacks were at the worst.

If the hypochondriacal patient feels a dread of diseases merely on account of some depraved sensations, we cannot wonder that the hysteric patient, in whom many of the functions are often manifestly disturbed, should believe herself to be labouring under incurable disorders. The action of the heart, for instance, is very frequently irregular in hysterical patients; the pulse intermits, and peculiar sensations of oppression, or obstruction, or temporary cessation or interruption of the heart's action, are not uncommon. The distinction of such cases from those in which the heart is actually undergoing some change of structure is exceedingly important; especially where, as not unfrequently happens, the palpitation depends on debility, induced perhaps by a previous attack of fever or other illness; for in such weakened states the symptoms of hysteria often manifest themselves, and bloodletting and other measures, which in the case of slow organic change might be requisite, would, by still further increasing the debility, exasperate the hysterical malady, and probably render it inveterate.

Divers troublesome symptoms incidental to females of delicate constitution, and often looked upon as inexplicable, and consequently as affording no clear indications of treatment, are discovered to be truly hysterical in their nature, either from its being found that less equivocal signs of hysteria are occasionally exhibited by the patients liable to them, or from the success which follows the administration of what are called anti-hysteric remedies. Among these symptoms are an occasional loss of voice; a difficulty of swallowing sometimes so great as to create fears of an obstruction of the gullet; pain fixed to one particular spot, as in the left side, or in the loins, or over one eye. These affections are not unfrequently very obstinate, resisting all kinds of treatment for months, or returning after short intervals of relief, even for years. When their dependence on a disordered condition of the nerves is not suspected, the patients are, of course, needlessly subjected to various plans of treatment, founded on a belief in the existence of local disorder. Extreme pain in the course of the spine, with great tenderness and a loss of power in one or in both of the lower extremities,—a combination of symptoms sufficient to excite apprehension,—are all found, in some cases, to depend on a morbid condition of the nervous system, and to be parts of hysteria. All these circumstances expose the hysterical patient to the same deceptions which we have said that unprincipled pretenders to medicine practise with so much impunity on the hypochondriacal. To assert the existence of some serious local disease is to gratify the patient by conforming to her own belief, and to ensure her fullest confidence. To tell her there is no local disease; that her symptoms depend upon her general state of health; and that relief is only to be expected from long perseverance in the use of medicine calculated to improve it, and united with the sacrifice of some indolent or luxurious habits; is to preach a very unwelcome doctrine, and often ensures the dismissal of the too-faithful counsellor.

The attacks of hysterical pain are sometimes so sudden and so violent as, when affecting the head or the bowels, to excite, even in the minds of the practitioner, much doubt as to their possible origin and tendency, and few parts of medical practice call for a more careful comparison of all the attendant symptoms. The absence of fever, the tranquillity of the pulse, the complete intermissions of pain occasionally occurring, and other symptoms according to the particular case, can alone be guides to practice, and, warily regarded, save the patient from very unnecessary measures.

In certain examples of hysteria, the paroxysm or fit is such that the patient lies motionless, breathing slowly and deeply, and resembling one apoplectic. What is called catalepsy, or a state in which the muscles, no longer obeying the will, continue contracted in whatever position or attitude the limbs or body may be placed, seems to be a variety of hysteria. The *trances* in which patients have been supposed to be dead, but many of the cases of which are fabulous or exaggerated, are also of the family of hysteria.

There are other varieties of hysterical affections, so extravagantly odd as sometimes to have caused suspicions that the subjects of them were under the influence of magic or witchcraft. Such strange motions of the limbs, such unaccountable predilection for the repetition of some unmeaning syllables, or for singing, "without mitigation or remorse of voice," a few notes suggested no one can tell by what association of ideas, or snatches of ballads or spiritual songs, have at times characterized this disorder, that its being ascribed to supernatural agency really cannot excite surprise; the more especially as such strange forms of affliction, like all the forms of hysteria, are found to be *catching*, and have even at times prevailed as a kind of epidemic. It has also sometimes happened, that amidst the excitement of the malady the patients have been gifted with such acute mental perception, or so much activity of the mental powers, and such unwonted eloquence, as to seem to the unaffected to be endued with the spirit of prophecy and divination. The history of animal magnetism presents some remarkable illustrations of these circumstances.

The *causes* of hysteria are often purely corporeal, connected with some disorder which the physician may recognize; either some disorder peculiar to the female system, or existing in the organs of digestion, and particularly in the neglected state of the bowels; or in the state of the patient's strength or weakness, as in fullness of habit, or the state opposite to fullness; or in a peculiar susceptibility of the whole nervous system. This susceptibility is always one link in the chain of causes, and sometimes it is itself the chief cause. When depending, with all the hysteric phenomena elicited in consequence of its existence, on primary disorder of the stomach and bowels, or of the uterus, the cure is strictly medical. The removal of the primary disorder will sometimes be followed by a return of the nervous system to its healthy condition, even in cases in which hope had almost been abandoned; but both in this case, and in the case of the nervous susceptibility being itself apparently the chief or primary cause, a mixed treatment is demanded, regiminal, medicinal, dietetic, and moral, which can only be instituted or pursued by the combined efforts of the physician, and of parents, relatives, friends, and guardians.

Southern climates tend to develope the too great sensibility of the nerves which disposes to hysteria; and certainly the enervating and artificial atmosphere of very warm rooms, in which young women often spend much of their time in our own climate, is exceedingly detrimental to the general tone of the nervous system, entirely indisposing them to face the air and persevere in taking exercise on foot. The indolence of the morning is very ill compensated for by the fatigues of the evening, where, in rooms greatly heated and crowded, the young lady who passed the morning in bed, and the middle of the day on the sofa or in an easy chair, passes the night in dancing, or in listening to musical performances, prolonged far beyond midnight.

Nothing is more remarkable in the present age of mental excitement than the care with which, by most of the prevalent customs and a system of fashionable education, the minds of the generality of females are consigned to inactivity and utter uncompanionable insipidity. Whilst the expression of almost every elevated feeling is repressed as inconsistent with refinement, every artificial want, every habit of selfish gratification, is as much as possible indulged. Active exercise in the open air, cheerful country walks, a joyful participation of the hearty pleasures of any society in which every movement is not taught by the posture-master, or conversation conducted according to the rules laid down in books professing to teach female duty and behaviour;—all this would be inconsistent with the general aim of all classes to imitate the manners and habits of the highest. All kind of reading, except of works the most frivolous, is considered ungenteel, or at least, singular; and any display of deep and unsophisticated sentiment excites universal pity. The beauties of nature, the triumphs of science, the miracles of art, excite no more than a languid expression of wonder. To apply the mind to read or understand such things would destroy the apathetic elegance which those desire to preserve, who still believe knowledge to be a very good thing for persons who live by it. With as much care as the natural proportions of the female figure are destroyed by stays made upon abstract principles, is the mind cribbed and cabined by custom and fashion. Then, universal ambition leads to universal difficulties as to fortune; and the only serious duty to daughters is to obtain an advantageous settlement, which, whether gained or missed, is too often thus the cause of cureless discontent, injured health, and all the nervous maladies incidental to an ill-managed mind and infirm body.

Barely equal to sustain a life of indolence, from which all strong and all noble emotions are shut out, the slighter pains and disappointments of life induce suffering in the frivolous and morbid mind; and any serious contradiction, any check to indulgence, any appeal of duty against pleasure, produces discontent, agitation of the nervous system, tears, low spirits, bewailings, the vapours, or a hysteric fit. The tendency to the latter exhibition of feelings injured or irritated, is found to be partly under the control of the will, or is at least often yielded to as the shortest way of putting an end to the disagreeable opposition of parents or a husband. Youth gives place to middle age, and middle age leads on to declining years, and, the mind having no resources to retreat upon, the frivolity of early life is too frequently exchanged for a feverish devotion and a chronic hysteric sensibility. Vainly hoping to obtain from various stimulants that feeling of health which no stimulants can bestow, so long as good atmospheric air is not breathed and the voluntary muscles are not exercised, the invalid sinks by slow degrees into all the selfish inactivity of a confirmed valetudinarian; and in these cases the double grievance of hypochondriasis and hysteria is often incurred by the same individual, and seems to furnish an excuse for the neglect of every duty requiring the smallest exertion of body and mind. See *Histoire Philosophique de l'Hypochondrie et de l'Hysterie ; par* M. Dubois, Paris, 1833, 8vo., and Foreign Quarterly Review, No. 23.

I

INGLIS, Henry David, a popular writer of travels, was the only son of a barrister in Edinburgh, and was descended from a very ancient family. His maternal grandmother was daughter of the celebrated colonel James Gardiner, who fell at the battle of Prestonpans; and was herself the authoress of an heroic poem. Through her Mr Inglis was allied to the noble house of Buchan and the Erskines. The writings of Mr Inglis are twofold—Travels and Fiction. Of the former class, his "Spain in 1830" is unquestionably his best work; and his "Ireland in 1834" attracted very considerable notice. His "Channel Islands" abounds in elegant descriptions of natural scenery; while his "Tyrol," his "Switzerland and the Pyrenees," and his "Norway," are all books of much merit, and have altogether contributed to establish for him a just and well-earned reputation; while they have been of great utility to the world, by making one part of it better able to appreciate the moral character and the physical advantages possessed by other parts. Of his fictitious works his "New Gil Blas" has been ranked by his biographers as his best. Mr Inglis died in London, on the 20th March, 1835, aged forty.

INGLIS, John, D.D., an eminent divine of the church of Scotland, was a native of Perthshire. In 1776, he was translated from the parish of Tibbermuir to the Old Greyfriars' church in Edinburgh, where he became the colleague of Dr Erskine, and the successor of principal Robertson. He was subsequently appointed one of the deans of the Chapel Royal. For nearly thirty years, he was the leader of the presbytery of Edinburgh; and, though he differed in church politics from what is called the popular party, he lived with all on terms of affectionate kindness and cordiality. As a preacher, his discourses were much admired for their intellectual character. His death took place, at Edinburgh, on the 2d Jan., 1834, at the age of seventy-one. Besides some minor publications, he left two works of great merit—one on the Evidences of Christianity, and another in defence of Ecclesiastical Establishments.

INSANITY. (*a.*) There is an opinion afloat that insanity is on the increase in this country, and the opinion is in some degree borne out by a comparison of late registers with those of an older date. Dr Powel, who first directed attention to this particular department, grounded his belief of a positive increase on the apparent augmentation in the London registers for lunatics. These included all lunatics confined in private asylums throughout England, which gave an increase as compared with eight quinquennial periods from 1775 to 1814; the aggregate for the former being 1783, for the latter 3647. This is a conclusion which Dr Burrows says is not borne out by facts, as the register does not comprehend lunatics confined in unlicensed houses. Comparing the lunatics with the census of the population for 1800, Dr Powel arrived at the conclusion, that there was one lunatic to 7300 persons, a conclusion which shows how absurd it was to attempt a statistic account of insanity with means so inadequate. Pinel thought that the increase in the returns of the insane might be accounted for in various ways —irregularity in former returns, and increase of the inmates of asylums, from the better arrangements which now prevail. He says that the greater the liberty in any country, the greater the number of insane is likely to be.

In 1806, a select committee was appointed to inquire into this subject, and in the report which they sent in, they gave for England and Wales an aggregate of 2248 lunatics. In 1815 another report was made, which gave nearly double the number, but which increase should be ascribed to the inaccuracy of former returns rather than to any positive augmentation in the number of the insane. By the returns which were made in 1819, Dr Burrows found the aggregate of lunatics confined in public hospitals and asylums to be 1456, in private asylums 2585, in all for England and Wales, 4041, to which he added half the number for those confined in private asylums not registered. In this way he raised the whole number to 6000, which he considered the nearest approximation to the total number of lunatics in Great Britain, and which gives us a proportion of about one lunatic in 2000 persons. In 1826, Sir A. Halliday made a return of the lunatics confined in public and private asylums in England and Wales, giving as the gross amount, 4782, to which he adds those of whom the law takes no notice, as living with their friends, and concludes, from an experience of twenty-five years, that the number confined in England and Wales, in public and private asylums, exceeds 8000; yet, with this apparent augmentation, he is not disposed to believe that insanity is on the increase with us. He estimates the insane of Scotland at 3700. In 1829 he sent in another report, which gave for England and Wales, 6806 lunatics, and rates the idiots at 5741, to which he adds for places not returned 1500, in all 14,000. The proportion of insane to the population is, he says—England one in 1000; Wales, one in 800; Scotland, one in 574. In the gross amount of 14,000 the paupers are estimated at 11,000.

Some very curious returns have been made, showing the influence of different habits and pursuits in life in producing insanity. In twelve English counties where the population is employed in agriculture, the proportion of insane to the general population is one in 820, and the lunatics are to idiots as five to seven. In twelve counties where the people are differently employed, the insane are to the population as one to 1200. People who work in mines are reported to be less liable to insanity than those who work on the surface. Is it because they are less exposed to the exciting influences of a busy life, which are ever passing around us in our intercourse with the world, and from which miners are for a great portion of their life withdrawn? In six maritime counties the lunatics are to the population as one to 1000, and idiots are to lunatics as two to one; while in six counties of North Wales there are seven idiots to one lunatic, and one lunatic to 850. In South Wales the proportion of lunatics to the population is one to 750, and idiots are to the insane as one to eight and a half. Throughout Wales, as in many parts of England, there is a preponderance on the side of female lunatics over males; female idiots are also more numerous than males; in Wales the excess is very great. The explanation afforded for this is, that nearly half the population is employed in agriculture. There is a general impression that, in agricultural districts, where people work heard and where females are employed in labour, the violent exertions required in such occupations produce distortion of the body, and may very materially affect the growth and development of the brain, and even the form of the cranium *in utero*. It is well known that females are obliged to work during the whole of their pregnancy, and there can be no doubt of the injury which such occupations must entail on the offspring. According to a return made for Scotland in 1821, the proportion of lunatics to the population is one to 474, but little reliance can be placed on this as a correct estimate of the state of insanity there. By the returns which were made for the French hospitals, from 1801 up to 1823, there is a steady and progressive increase. The first return gave, in 1801, 1070 lunatics, and the last, in 1823, gave 2493. Rating the population at thirty-two millions, Esquirol estimates the insane as one in 1000. In France, as in England, the operating causes vary very much. Of 336 lunatics in his establishment, Esquirol says, there were only three from drunkenness. It, however, prevails as an exciting cause to a great degree in Salpetrière, where women only are admitted, and of whom one-twelfth part are girls of the town. We find also, by the reports which Dr Whally has made on the effect of drunkenness, that it prevails to a great extent in Lancaster infirmary.

All the attempts which have hitherto been made to account for insanity by pathological appearances have proved hopeless. In examining the morbid results, we are led to consider how the mental disease could have resulted from them; but here the nature of the subject completely baffles us. In cases of other diseases, as of the lungs, whose functions are now well understood, the morbid change accounts for the derangement, but the case is quite different when the mind is affected. We are ignorant of the manner in which it performs its functions, and of the connection between the organic agents and the operations commonly referred to it. Hence, some are inclined to doubt whether the phenomena of insanity are the result of changes discovered in the brain, and view them as the result of the diseased operations of the mind, believing that hardness of brain and thickening of membranes are only formed after mental disease of long standing, and are altogether wanting in recent cases of insanity; upon these grounds mental disease is considered as a deviation from the healthy state, different from that which anatomy exhibits.

The different states of the intestinal canal have been considered a fruitful source of insanity, both to the rich and the poor—to the former, from over-indulgence; to the latter, from very opposite causes—low diet, bad food, cold, constipation. Worms have been viewed as producing it, because, in some cases, mad people were cured, on the expulsion of worms by the intestines. Esquirol records two cases of this kind. It was also a popular belief that it is more intimately connected with disease of the abdominal viscera than the thoracic, but this has been proved not to be the fact. In 168 cases Esquirol found only two cases of liver-complaint, whilst in the same number he found sixty-five cases of disease of the lungs, and he is disposed to believe that insanity is attended by disease of the thoracic viscera in two cases out of eight. To this opinion Georget is inclined, who adds, that one-half of the lunatics who die at Salpetrière are cut off by phthisis. In some of those patients it is rather curious that, where large excavations are found to exist after death, no expectoration took place during life. Greding found in a hundred maniacs, forty affected with phthisis; of the whole number, seventy-six had effusion into one or other cavity of the thorax.

In the Dutch States, the number of insane, from 1820 to 1825, was 4520. Guislain is disposed to ascribe the increase of insanity to the positive augmentation which has taken place in the population since the war, by which the number may be augmented in the ratio of the population. He agrees with Sir A. Halliday, that though a temporary augmentation may take place, from the pressure of circumstances, there is no danger of its permanently progressive increase.

The returns afforded by the Prussian States, if correct, should necessarily alarm us, but Jacobi, who has had opportunities of judging of their fidelity, attaches but little faith to them. The proportion of lunatics there to the population, is one in 666½.

Perhaps the best statistics are supplied by the government of Norway. In 1825 returns were ordered of the sex, age, situation, and number of insane. The report was drawn up by Dr Holst, and published in 1828. The lunatics are to the population as one to 551. Here is a marked difference as compared with England and France. The population of Norway is employed much in agriculture and rearing cattle, embosomed in mountains, and without any manufacturing towns. These are to be taken into account in considering the comparative state of insanity there, in comparison with other countries.

From Spain we are without any satisfactory returns, while we find the Italian States giving only one in 4879. Here we find that, where insanity is scarce, idiotism is always found to predominate, more especially in Spain and Portugal.

The statistics of insanity in the United States of America are less complete than those of Europe. In many of the States nothing is known upon the subject, no measures having as yet been adopted to ascertain the number of the insane. A few of the States have made some partial investigations; but the object of these has generally been to ascertain if the insane were sufficiently numerous, and their situation sufficiently necessitous, to require the assistance of the state for their support. That there was such a number, and such want, has soon been ascertained, and then further investigations ceased. A committee of the legislature of the State of New York, appointed to examine this subject, reported in 1831, that there were then in that State 2695 lunatics and idiots, or one to 713 of the population. Of this number the committee considered *five eights* to be idiots. In 1821, the great number of recent cases of insanity in Connecticut, led a few medical gentlemen to attempt ascertaining the whole number of the insane in the State, and to devise the means of providing an hospital for their reception and cure. "To obtain information," they say in their published report, "circulars were sent into every town in the State, addressed to clergymen, physicians, and other respectable gentlemen, requesting returns of the number of the insane, their ages, sex, cause of disease, &c. The returns in answer to these circulars, although many of them were very imperfect, satisfied the committee that at least *one thousand* individuals within the limits of the State were mentally deranged, and that the condition of most of them was truly deplorable." As the population of the State was at that time 275,202, this would be *one* insane person to 275 of the population; a proportion so great that we suppose some idiots were included; though we know it was the decided opinion of Dr Todd, the late distinguished physician to the Connecticut Retreat for the Insane, whose means of information on this subject were better than those of others, that *one thousand* was not above the actual number of the insane in the State of Connecticut. In Massachusetts insanity appears also to be very common. Dr Parkman of Boston, stated in 1818, that 541 insane persons had come to his knowledge in that State, though he supposed he had heard but of part. In 1833, a committee of the legislature of that State reported they had ascertained that in sixty-eight towns, containing a population of 264,327, there were 168 insane persons and 111 idiots, *in confinement in gaols, alms-houses, and houses of correction.* This would afford above 600 insane and idiotic persons in confinement in the State, if we assign as many in proportion to the rest of the population. But it is probable only a small part are thus confined; and no doubt an accurate inquiry would exhibit more than double or triple that number. From considerable knowledge of portions of Massachusetts, we are confident, that at the time referred to, not more than one-fourth, or one-third, of the insane and idiotic were in the places of confinement alluded to by the committee. In New Hampshire, it appears from recent inquiries that insanity is nearly as prevalent. A committee of the legislature of that State reported, during 1837, 350 insane persons in the State, exclusive of idiots. We are informed that the committee, who made the report, were of opinion this estimate was too low. But this number exhibits *one* case of insanity to 800 of the population; and if we add as many idiots in proportion to the insane, as there are in the State of New York, there would be *one* crazy or idiotic person to 300 inhabitants. A select committee of the legislature of the State of Vermont recently reported, that there were, in fifty-nine towns, sixty insane males and eighty-four females, making a total of 144, of whom forty-five are town paupers, and forty are poor and destitute. This committee estimate the whole number of the insane in the State, exclusive of idiots, at 300, or one to 1000 inhabitants. These statistics respecting insanity, though few and imperfect, show, that the disease is alarmingly prevalent in the northern States of the Union.

With respect to the treatment of this very distressing affection, the only hopes of cure rest upon an early application for proper medical advice. The average duration of the complaint under the care of Pinel was from five to six months, but the greatest number of recoveries took place in the first month. This is also the opinion of Esquirol. The greatest amount of recoveries is obtained in the first two years, but the mean duration is less than one, and after the third year, the chance of cure is scarcely one in 30. This is a conclusion at which Esquirol arrived, founded on an experience from 1804 to 1813 at Salpetrière. A similar conclusion has been come to at the Gloucester asylum.

The most favourable age for recoveries is from twenty-five to thirty, but women frequently recover after forty-five; and there are four cases recorded at Charenton of recoveries where each patient was seventy years old. Writers in general admit that recoveries are more frequent in women than men.

Dr Burrows gives a report of cures in recent cases ninety-one in 100, and in sixty-four old cases nineteen cures. This is considered by some as much too great, and they account for it by supposing, that many were discharged before a complete cure was effected. Esquirol states that, out of the gross amount of admissions at Bicêtre, of 12,592, 4968 recovered. At Bethlem, St Luke's, and the York asylum, the admissions from 1748 to 1814 were 16,516, of whom 5918 recovered. From this it appears that the cures in England were formerly fewer than in France. In Lancaster there were admitted, from 1817 to 1832, 1750 lunatics; of these, 597 were cured, a proportion of about forty in a hundred. In the Retreat, near York, from 1812 to 1833 inclusive, 334 were admitted. Of these, 168 were cured, fifty died, thirty-seven removed, ten improved, sixty-nine remained. Here the probability of recoveries in recent cases is nine to one.

Insanity is not reckoned among the diseases injurious to life. In this state the brain, though unfit for intellectual operations, is able to carry on other processes dependent on it, but which are subservient to physical existence. In 1812 there were at Bicêtre one who was there fifty-six years, three upwards of forty years, twenty-one more than thirty years, fifty upwards of twenty years, and 150 for ten years. The dates of entry for seven cases, at Salpetrière, were from fifty to fifty-seven years, eleven from fifty to sixty years, and seventeen from forty to fifty.

The admissions of males to females are, at Charenton, as three to two. At Bicêtre the case is reversed, females are to males as three to two. In the south of France there are more females than males in asylums; the contrary obtains in the north; but throughout France the females are to males as fourteen to eleven. In Spain there is an excess of females of one-fifth over males. In Italy the males predominate. According to the returns which Guislain has made of Holland and Belgium, females are to males as thirty-four to twenty-nine.

In Great Britain and Ireland the males are to females as thirteen to twelve, and in the United States the males are to females as two to one. Esquirol shows, from the gross amount of lunatics confined all over Europe, of 76,526, that there were 37,825 males, and 38,701 females, about thirty-seven to thirty-eight, without the fraction.

Insanity is not limited to any particular age; it may begin as early as two years of age, but does not become common until fifteen. Georget has collected, from the admissions in France and England, from the age of ten to seventy, 4409 patients, and the average of admissions for every ten years:—

From 10 years to 20	356
20 - 30	1106
30 - 40	1416
40 - 50	861
50 - 60	461
60 - 70	174
70 and upwards	35
	4409

There is one leading feature in the management of the insane in which all writers seem to agree—seclusion. Pinel dwells on it as the most rational mode of cure, and considers the separation from friends as indispensable. Willis changed all the servants of George III. Confinement is also necessary; but there is still considerable difference of opinion how far it should be carried.

A system of treatment is adopted at Gheel in Belgium, which, if acted on in other countries, would doubtless be productive of great advantages. Gheel is a small village, where 500 or 600 lunatics are spread among the cottages of the peasants. Each patient is to labour in the fields or gardens for a certain number of hours every day. When not employed they are allowed to walk about without restraint, and are summoned to their homes by a village bell. The peasants are bound to treat them with kindness, and are rewarded according to the care they take of them.

A farmer once obtained in Scotland a great reputation for curing insanity. He fastened his patients to his plough, and made them work his grounds, and by degrees brought the most intemperate to reason. Music has been employed with variable success in the treatment of the insane. There are two states in which it may be useful; first, when the invalid himself plays, his attention is for a time agreeably occupied; and next, when another person plays, pleasing sensations are thus commonly excited. Frank employed it largely, and found it of great advantage in mania, while Esquirol states, that he found it in similar states to produce raving fits. There is an impression with the majority of the profession, that in mania it is too exciting, but in states of lethargy or apathy it may be used with benefit. Dr Cox employed it largely in his establishment, but his successor, Dr Bompas, has altogether discontinued it. The Quakers, in the Retreat at York, were the first who discontinued the use of chains; and the only restraint used there is, seclusion, a straight-waistcoat, shower-bath, and a few occasional privations.

With respect to the frequency of insanity in the different states and conditions of life, Esquirol has supplied some interesting returns:—For the three years, 1826—1828, there were admitted into Charenton 619 patients; of these, 282 were married, 293 never married, and 44 widowed. The number of men was 386, women 253. Of the men 206 were unmarried, and 87 of the women, which shows celibacy to be a fruitful source of insanity. Another large class, composing the inmates of this establishment, is made up of officers and soldiers. For the three years above mentioned, there were forty-nine officers and forty-seven soldiers admitted, a proportion exorbitantly great, considering the relative number of each class. Hereditary insanity is here estimated at one-seventh of the admissions.

From the review which we have now taken of the statistics of insanity, we do not think that the opinion advanced by some writers, of a positive and permanent increase in that painful and distressing affection, is at all supported by facts. That there is an apparent increase in the number returned of late, as compared with older records, is quite clear, but this is only what is manifest in every other department of inquiry, when attention is particularly directed to a subject previously much neglected. The question of insanity was hitherto surrounded with so many delicate and distressing associations, that many cases have altogether escaped notice. And when we consider the system of treatment which then universally obtained, we cannot wonder that the insane were allowed to drag out a miserable existence in the society of friends, rather than be consigned to the hopeless alternative of chains and a dungeon. The improvements which a mild but decisive system of treatment, first adopted by those quiet unobtrusive men, the Quakers, in the Retreat at York, have at length forced themselves on general attention. It is now the prevailing system throughout Europe, and in all our own institutions. Those asylums are now so much improved in their internal economy and comforts, and the chance of cure so great, when attention is early directed to it, that cases are instantly sent thither, which, under the former bad arrangements, would never have reached them. In this way the apparent increase may be accounted for; besides which, slight shades of mental aberration are now classed under one or other form of madness, which probably, at a period when the subject was not so well understood, would not be classed at all under any form of insanity. These, with other temporary causes, will occasionally give a slight increase in the returns, which is often mistaken for a progressive augmentation in this painful disease.

Asylums for the insane are of modern origin. In fact, all public hospitals for the sick and poor may be so considered, as they originated with the Christians of the third or fourth century. But long after those suffering from other diseases were received into hospitals and provided with medical assistance, lunatics were neglected, and perished in great numbers. Some of the most furious were confined in small cells, or shut up in convents and dungeons, while others were burned as sorcerers, or as possessed of demons. Those that were tranquil were permitted their liberty, abandoned however to neglect,—to the abuse and laughter, or to the ridiculous veneration of their fellow-creatures. But about the commencement of the seventeenth century, lunatics began to be received into the general hospitals, where they were confined in the most obscure corners of the buildings, and received no medical aid. Soon after this, in some of the large towns of France, a few separate but poorly conducted hospitals were provided for the insane, though the greater part still remained at liberty, or were confined in the general hospitals. It was not until 1792, when M. Pinel was appointed physician in chief to the Bicètre at Paris, that correct views respecting the treatment of the insane began to prevail, and to be reduced to practice. At this institution, when M. Pinel took charge of it, were a large number of lunatics considered incurable. Many of them being very furious, were kept constantly chained. This illustrious physician, after having in vain solicited the government to allow him to unchain these maniacs, finally went in person to the authorities, and advocating, with much warmth and earnestness, the removal of this monstrous abuse, obtained permission to do as he pleased respecting them. Great fears were entertained for the personal safety of M. Pinel, should he undertake to unchain them. This, however, he resolved to do. The first man on whom he tried the experiment was one of the most furious, who had been in chains forty years, and had already killed one keeper by a blow with his manacles. Pinel entered his cell unattended, and offered to remove his chains and permit him to walk in the court, if he would promise to behave well and injure no one. "Yes, I promise you," said the maniac. His chains were then removed, and the keepers retired leaving the door of his cell open. "He raised himself," says the son of the celebrated Pinel, in a paper read at the academy of sciences, "many times from his seat, but fell again on it, for he had been in a sitting posture so long that he had lost the use of his legs. In a quarter of an hour he succeeded in maintaining his balance, and with tottering steps came to the door of his dark cell. His first look was at the sky, and he cried out enthusiastically, 'How beautiful!' During the rest of the day he was constantly in motion, walking up and down the staircases, and uttering short exclamations of delight. In the evening he returned of his own accord into his cell, where a better bed than he had been accustomed to had been prepared for him, and he slept tranquilly. During the two succeeding years which he spent at the Bicêtre, he had no return of his furious paroxysms, but even rendered himself useful, by exercising a kind of authority over the insane patients, whom he ruled in his own fashion." In the course of a few days, Pinel released fifty-three maniacs from their chains. The result was happy beyond his hopes. Tranquillity and harmony succeeded to tumult and disorder; and, by the aid of continued mild and judicious treatment, the most furious became calmer and more tractable, and many were restored to perfect health of body and mind. This transaction caused much sensation, not only in France, but throughout the civilized world, and created a revolution in the treatment of this unfortunate but hitherto neglected portion of our fellow-creatures. To M. Pinel is unquestionably due the great credit of first employing judicious, systematic, moral means in the cure of the insane.

At present there are in France many large institutions for the reception and cure of lunatics. Among the most celebrated are the *Salpêtrière* and the *Bicètre*, and the *Maison Royale de Charenton*. The former, at the southeastern extremity of Paris, is composed of several buildings, enclosing spacious gardens and grounds for exercise. This is for the accommodation of females only. It usually contains about 1000 lunatics. These are divided into three classes, the curable, incurable, and idiotic. M. Pariset has the medical superintendence of the curable class. The Bicêtre, about two leagues from Paris, receives only males. It usually has from 350 to 400 patients. Here are also spacious grounds for exercise, and a farm where many of the patients are employed much of the time. The Maison Royale de Charenton, a short distance from Paris, is exclusively appropriated to the reception of the insane of both sexes, and contains 600 beds. Besides these, there are others in the vicinity of Paris and in many of the large towns of France, some public and some private, but all under good regulations and well conducted.

In London, so early as 1553, lunatics were received into the Bethlem Hospital, a royal foundation for lunatics, incorporated by Henry VIII. This hospital has been rebuilt several times, and enlarged. It is now a noble brick building, 580 feet in length, with accommodations for 400 patients. It cost about £100,000, and has an annual income of £18,000. St Luke's Hospital, another institution in London for the reception of lunatics, originated in 1732. The present building, though commenced in 1751, was not completed until 1786, at an expense of £55,000. It is a solid brick edifice, 500 feet in length, and accommodates 300 patients. This hospital has an annual income of £9,000.

Both these old establishments are quite defective, as they are without the useful appendage of spacious grounds and workshops, for the exercise and employment of the patients. In other parts of England, in Ireland, and Scotland there are many well arranged and well conducted lunatic establishments. Among the most celebrated, are the Wakefield Asylum for the West-Riding of York, and the Lancaster Asylum, in England; the Richmond Asylum at Dublin; and the Glasgow Lunatic Asylum in Scotland. But there are several others, more recently established, equally well conducted. Most of these institutions can accommodate from 200 to 300 patients. Workshops are generally attached to them, and twenty or thirty acres of land, where the patients are much of the time employed at their trades, or in agriculture. In addition to such public institutions, private ones, for the accommodation of a limited number of lunatics, are numerous in England. Often one such receives only those of the same sex. Some of them are fitted up with great elegance, with every thing desirable for the safety and welfare of the patients, affording to them all the advantages of a secluded private residence, with large, airy and commodious apartments, beautiful gardens and grounds for exercise and amusement, together with experienced and careful medical superintendence.

In many of the other states of Europe, hospitals for the insane have been provided. Some of them are well, and others badly conducted. In the Netherlands, according to Halliday, much attention has been paid to the relief and comfort of the insane. At Ghent are several public establishments, and one private, for their accommodation. At Antwerp there is an excellent hospital for lunatics. It was built about thirty years since, and usually has between 200 and 300 patients. With this is connected the celebrated and singular establishment at Gheil, which, with perhaps some modifications, might be adopted with advantage in this country. It consists of a village, or a number of detached cottages, far removed from other habitations. These buildings are occupied by peasants of good character, who receive lunatics,—mostly those that are convalescent,—treat them with great kindness, and employ them in the cultivation of the land. Each patient is obliged to labour a certain number of hours every day when able; and when not so employed, is allowed to walk about without restraint. Scarcely any accident occurs, and very few attempt to escape. The recoveries here have been so numerous and rapid, that the fame of the institution has extended far, and many persons of distinction have been sent to it for recovery.

In Bavaria and Saxony, much has been done by government for the welfare of the insane. In Denmark and Sweden there are several lunatic hospitals. Those in the former, and especially the one at Copenhagen, merit high commendation. Many of the large towns of Italy have one or more asylums for lunatics. At Milan there is a well conducted lunatic hospital, containing near 500 patients, most of whom are employed in gardening and in manufacturing clothing. At Genoa, part of the hospital of incurables is given up to the insane. About 250 are kept here in a wretched condition.

At Florence, the average number of the insane in the *Spedale di Bonifacio*, the hospital appropriated to them, is about 300. The patients are clothed alike, in white woollen dresses, and have their apartments kept very neat. When it becomes necessary to confine a patient, his hands are placed in a wooden case, and bound to the abdomen by a strap around the body. Furious patients are confined in dark rooms with well padded walls. The darkness is thought to be very serviceable in rendering them more tranquil. The management of this institution appears to be good. Many of the male patients are employed in gardening, or at their trades, and the women in knitting and spinning. At Rome, the hospital for lunatics consists of two separate buildings, one for each sex. The number of patients is about 400. The most furious are confined by chains. All varieties of insanity are mixed together, and no moral measures are resorted to in their treatment. At Naples is the celebrated Aversa, an hospital for lunatics. The sexes are here in different buildings, above 200 in each. Great regularity prevails throughout the institution. On ringing a bell, the patients rise, breakfast with decorum, and the more quiet are present at religious worship. Though the advantages of this institution are said to have been exaggerated, it is the most extensive and best regulated hospital for the insane in Italy.

In Germany, some of the lunatic hospitals are well conducted, and others not so. At the one in Berlin, containing 150 patients, no moral treatment appears to be adopted. There being no grounds for exercise, the patients are constantly confined to the house. At *Sonnenstein*, about four leagues from Dresden, there is a government establishment for insane patients, and the most celebrated and best conducted institution in Germany, if not in Europe. It consists of an ancient castle, situated on a hill, with extensive adjacent grounds. The number of patients is about 200; most of whom are occupied in good weather out of doors, in walking about the grounds, cultivating flowers, digging, &c. The women have a flower-garden in their department, which serves to occupy and amuse many of them; and others sew, knit, and spin. None are confined to the house; even the most furious patients are allowed to walk about with the others, with cloaks that conceal the apparatus that confines their hands. This measure is said to tranquilize them more than any thing else. The whole establishment is kept extremely neat, and contains workshops, a saloon of amusement, with books, a piano, draught boards, and a billiard room. At a distance from the large building, in a lovely garden at the base of the hill, is the house for the convalescents, furnished with musical instruments, and other things for the amusement of those who are recovering

A few miles from Bonn is another excellent hospital for lunatics, on the same plan as the one at *Sonnenstein*. It contains about 200 patients. Dr Jacobi is the superintending physician, and resides in an adjoining house.

In the United States, hospitals exclusively for the insane are of quite recent origin. That established by the Society of Friends near Frankford, in the vicinity of Philadelphia, in 1817, may be considered the first; though a separate building was allotted to those at the New York hospital in 1808. But previous to this, the general hospitals of Philadelphia and New York received lunatics. Ever since the establishment of the Pennsylvania hospital in 1752, lunatics have been received there as patients, though not until 1796 was a part of the building exclusively appropriated to them. At this time upwards of seventy rooms were opened for their accommodation. From its establishment in 1752 until 1836, 4116 lunatics were received, of which number 1349 were cured, 810 were relieved, and 548 died. More than twice as many males as females have been admitted to this hospital.

Too much attention cannot be given by the proper authorities to the prevention of abuses in lunatic hospitals. There are no institutions where abuses are more likely to arise; none where they are more difficult to detect. This the history of such institutions, in England and other countries, but too painfully testifies. Some patients are frequently so violent and vindictive, that it requires great command of temper in their overseers not to retaliate sometimes; while others, instigated by appetite and passion, increased by their insanity, are perpetually on the watch to seduce those appointed to guard them, from their duty. Attendants of the most unblemished moral character, and remarkable for kind disposition, for calmness and intelligence, should be procured, and well instructed in their responsible duties; and be induced by proper compensation to devote themselves perpetually to the care of the insane.

Notwithstanding the attention hitherto given to the subject of insanity, much still remains to be learned. The medical superintendents of the institutions for the insane will have it in their power to add essentially to our knowledge of this important disease. Much, we have no doubt, is yet to be learned by autopsical examinations, made with the carefulness and minuteness which distinguish modern researches in pathology. It is already rendered probable, that in all cases of insanity there are specific alterations of the brain. These, with the symptoms of the disease, should be accurately ascertained and described. At the same time, the treatment adopted, and its effects, should be faithfully recorded, and occasionally made public. It is gratifying, to be sure, to learn from the Reports of Lunatic Asylums, that many of the insane are cured; but surely it would be more gratifying, and of far greater utility to the public, to be informed what were the means which produced such results. Is separation from home, from relatives and acquaintance, all that is required for the cure? If so, this should be known. Many would prefer, and in many cases it would be better, to accomplish this without sending insane patients to large lunatic establishments. If medicines are serviceable, these should be made known, and the cases in which they are necessary described. In this way, such information might be imparted, as would enable many to be restored, at home, or at the onset of the disease. We are of the opinion, that in a majority of cases of insanity, proper treatment in the commencement of the disease would remove it; and it will be very unfortunate for the community, if the impression becomes general, that insanity cannot be cured except at Lunatic Asylums. Cases of relapse, and we fear they are not few, should be ascertained as far as possible; and, together with the apparent cause, made known. The public desire the whole truth; and not merely to be informed that a large number of patients were considered cured, and discharged after a short residence in the hospital. They wish to know how many of these were original cases, how many of them re-admissions, what were the means of their restoration, and every particular calculated to throw additional light on the nature and cure of this mysterious disease. In this way, public Asylums, in addition to their present utility, will become valuable schools of instruction for all medical men, and be of incalculable benefit to the country and mankind.

But is the cure of insanity all that can be done to prevent its extension in this country? Cannot the causes of this disease frequently be ascertained and avoided? We believe they may. According to most writers on insanity, *moral causes* are far more operative than physical ones in producing the disease. "The observations," says M. Georget, "which I have had it in my power to make, the more numerous ones which I have compared in authors, have convinced me, that among 100 lunatics, ninety-five at least have become such from the influence of affections and moral commotions. It is an observation become almost proverbial in the hospital, (the *Salpétrière*,) 'qu'on perd la tête par les revolutions d'esprit.' The first question that M. Pinel puts to a new patient, who still preserves some remains of intelligence, is, 'Have you undergone any vexation or disappointment?' Seldom is the reply in the negative." This opinion derives support from the fact, that the disease mostly occurs at that period of life, when the passions are excited by the strongest interests, and is chiefly confined to the civilized and intellectual communities. Insanity is a disease of the material organ of the mind, the brain; and never occurs unless this organ is affected. It is, therefore, theoretically probable, that moral commotions, mental anxiety, and the excitement of the feelings and passions, which disturb the natural action of the brain, should most frequently produce this disease.

It is, however, extremely difficult to determine with accuracy the cause of insanity in many cases. In examining the records of Lunatic Asylums, we find intemperance in the use of intoxicating drinks mentioned as a very frequent cause. No doubt it sometimes is; but we are not without suspicion that there is some other primary and predisposing cause, that is essential to the production of insanity in the intemperate. Intemperance has long been, and is now, very prevalent in some countries where there is but little insanity; and the instances are so very numerous of long and habitual intoxication without any tendency to this disease, that our suspicion is strengthened that some other cause predisposes the brain to the disease we call insanity. Intemperance is very common among the negroes and the Indians, yet insanity is rare among them. The few cases of which we have heard among the former, appeared to arise from excitement of mind. Besides, the excessive use of intoxicating drink is not unfrequently the consequence, not the cause, of the mental derangement, and among the first symptoms of the disease. This fact has been often noticed. Still we do not doubt, that some cases are correctly attributed to intemperance; and still less do we doubt, that, as a secondary cause, it is of quite frequent operation, and has much increased this disease of late among the labouring classes. When there is an hereditary tendency to insanity, or when the brain has been much disturbed by anxiety and mental excitement, then the use of intoxicating drinks unquestionably tends to develope it; and we have no doubt that very many thus circumstanced would escape the disease, if they would entirely abstain from stimulating drinks.

But altogether the most frequent cause of insanity is hereditary predisposition. Even if one sane generation has intervened, there is not, then, a certainty the next will continue so. It is much to be feared, that if marriages are contracted in disregard of this fact, the numerous cures effected of late will but serve to increase the number of the insane in another generation. In those born of insane parents, much may be done towards preventing the developement of the disease, by attention to their education, both physical and mental. "Predisposition to insanity," says M. Esquirol, "may be traced from the age of infancy; it furnishes the explanation of a multitude of caprices, irregularities, and anomalies, which, at a very early period, ought to put parents on their guard against the approach of insanity. It may furnish useful admonitions to those who preside over the education of children. It is advisable, in such cases, to give them an education tending to render the body robust, and to harden it against the ordinary causes of madness; and particularly to place them under different circumstances, from those with which their parents were environed. It is thus we ought to put in practice the aphorism of Hippocrates, who advises to change the constitution of individuals, in order to prevent the diseases with which they are threatened, by the hereditary predisposition of their family."

INSURANCE. (*a.*) The improvements which have been made in the details of Insurance generally, the increased interest now taken in, at least, one department, that of Life Insurance, and the important effects produced on the commercial and social relations of this country, by the various protecting Insurances offered to the public, seem to demand a more lengthened exposition of the principles on which these contracts are based, than will be found in our former article under this head.

The elementary principles of Insurance, under its several varieties of *Marine Insurance*, *Fire Insurance*, and *Life Insurance*, are thus lucidly stated by Mr M'Culloch in his *Dictionary of Commerce*:—

"The loss of a ship, or the conflagration of a cotton mill, is a calamity that would press heavily even on the richest individual. But were it distributed among several individuals, each would feel it proportionally less; and provided the number of those among whom it was distributed were very considerable, it would hardly occasion any sensible inconvenience to any one in particular. Hence the advantage of combining to lessen the injury arising from the accidental destruction of property: and it is the diffusion of the risk of loss over a wide surface, and its valuation, that forms the employment of those engaged in insurance. Though it be impossible to trace the circumstances which occasion those events that are, on that account, termed accidental, they are, notwithstanding, found to obey certain laws. The number of births, marriages, and deaths; the proportions of male to female, and of legitimate to illegitimate births; the ships cast away; the houses burned; and a vast variety of other apparently accidental events; are yet, when our experience embraces a sufficiently wide field, found to be nearly equal in equal periods of time: and it is easy, from observations made upon them, to estimate the sum which an individual should pay, either to guarantee his property from risk, or to secure a certain sum for his heirs at his death. It must, however, be carefully observed, that no confidence can be placed in such estimates, unless they are deduced from a very wide induction. Suppose, for example, it happens, that during the present year one house is accidentally burned, in a town containing 1,000 houses; this would afford very little ground for presuming that the *average* probability of fire in that town was as 1 to 1,000, For it might be found that not a single house had been burned during the previous ten years, or that ten were burned during each of these years. But supposing it were ascertained, that, at an average of ten years, one house had been annually burned, the presumption that 1 to 1,000 was the real ratio of the probability of fire would be very much strengthened; and if it were found to obtain for twenty or thirty years together, it might be held, for all practical purposes at least, as indicating the precise degree of probability. Besides its being necessary, in order to obtain the true measure of the probability of any event, that the series of events, of which it is one, should be observed for a rather lengthened period, it is necessary also that the events should be numerous, or of pretty frequent occurrence. Suppose it were found, by observing the births and deaths of 1,000,000 individuals taken indiscriminately from among the whole population, that the mean duration of human life was forty years; we should have but very slender grounds for concluding that this ratio would hold in the case of the next ten, twenty, or fifty individuals that are born. Such a number is so small as hardly to admit of the operation of what is called the *law of average*. When a large number of lives is taken, those that exceed the medium term are balanced by those that fall short of it; but when the number is small, there is comparatively little room for the principle of compensation, and the result cannot, therefore, be depended upon. It is found, by the experience of all countries in which censuses of the population have been taken with considerable accuracy, that the number of male children born is to that of female children in the proportion nearly of twenty-two to twenty-one. But unless the observations be made on a very large scale, this result will not be obtained. If we look at particular families, they sometimes consist wholly of boys, and sometimes wholly of girls; and it is not possible that the boys can be to the girls of a single family in the ratio of twenty-two to twenty-one. But when, instead of confining our observations to particular families or even parishes, we extend them so as to embrace a population of 500,000, these discrepancies disappear, and we find that there is invariably a small excess in the number of males born over the females. The false inferences that have been drawn from the doctrine of chances, have uniformly almost, proceeded from generalising too rapidly, or from deducing a rate of probability from such a number of instances as do not give a fair average. But when the instances on which we found our conclusions are sufficiently numerous, it is seen that the most anomalous events, such as suicides, deaths by accidents, the number of letters put into the post-office without any address, &c., form pretty regular series, and consequently admit of being estimated *à priori*. The business of insurance is founded upon the principles thus briefly stated. Suppose it has been remarked that of *forty* ships, of the ordinary degree of sea-worthiness, employed in a given trade, one is annually cast away, the probability of loss will plainly be equal to *one fortieth*. And if an individual wish to insure a ship, or the cargo on board a ship, engaged in this trade, he ought to pay a *premium* equal to the one-fortieth part of the sum he insures, exclusive of such an additional sum as may be required to indemnify the insurer for his trouble, and to leave him a fair profit. If the premium exceed this sum, the insurer is overpaid; and if it fall below it, he is underpaid. Insurances are effected sometimes by societies, and sometimes by individuals, the risk being in either case diffused amongst a number of persons. Companies formed for carrying on the business have generally a large subscribed capital, or such a number of proprietors as enables them to raise, without difficulty, whatever sums may at any time be required to make good losses. Societies of this sort do not limit their risks to small sums; that is, they do not often refuse to insure a large sum upon a ship, a house, a life, &c. The magnitude of their capitals affords them the means of easily defraying a heavy loss; and their premiums being proportioned to their risks, their profit is, at an average, independent of such contingencies. Individuals, it is plain, could not act in this way, unless they were possessed of very large capitals; and besides, the taking of large risks would render the business so hazardous, that few would be disposed to engage in it. Instead, therefore, of insuring a large sum, as £20,000 upon a single ship, a private underwriter or insurer may not, probably, in ordinary cases, take a greater risk than £200 or £500; so that, though his engagements may, when added together, amount to £20,000, they will be diffused over from forty to a hundred ships; and supposing one or two ships to be lost, the loss would not impair his capital, and would only lessen his profits. Hence it is, that while one transaction only may be required in getting a ship insured by a company, ten or twenty separate transactions may be required in getting the same thing done at Llyod's, or by private individuals. When conducted in this cautious manner, the business of insurance is as safe a line of speculation as any in which individuals can engage. To establish a policy of insurance on a fair foundation, or in such a way that the premiums paid by the insured shall exactly balance the risks incurred by the insurers, and the various necessary expenses to which they are put, including, of course their profit, it is necessary, as previously remarked, that the experience of the risks should be pretty extensive. It is not, however, at all necessary, that either party should inquire into the circumstances that lead to those events that are most commonly made the subject of insurance. Such a research would, indeed, be entirely fruitless: we are, and must necessarily continue to be, wholly ignorant of the causes of their occurrence."

Marine Insurance.—The advantages resulting to commerce and navigation from marine insurance are immense. "Without the aid that it affords, (says Macculloch) comparatively few individuals would be found disposed to expose their property to the risk of long and hazardous voyages; but by its means insecurity is changed for security, and the capital of the merchant whose ships are dispersed over every sea, and exposed to all the perils of the ocean, is as secure as that of the agriculturist. He can combine his measures and arrange his plans as if they could no longer be affected by accident. The chances of shipwreck, or of loss by unforeseen occurrences, enter not into his calculations. He has purchased an exemption from the effects of such casualties; and applies himself to the prosecution of his business with that confidence and energy which nothing but a feeling of security can inspire. Besides insuring against the perils of the sea, and losses arising from accidents caused by the operation of natural causes, it is common to insure against enemies, pirates, thieves, and even the fraud, or, as it is technically termed, *barratry*, of the master. The risk arising from these sources of casualty being extremely fluctuating and various, it is not easy to estimate it with any considerable degree of accuracy; and nothing more than a rough average can, in most cases, be looked for. In time of war, the fluctuations in the rates of insurance are particularly great: and the intelligence that an enemy's squadron, or even a single privateer, is cruising in the course which the ships bound to or returning from any given port usually follow, causes an instantaneous rise in the premium. The appointment of convoys for the protection of trade during war, necessarily tends, by lessening the chances of capture, to lessen the premium on insurance. Still, however, the risk in such periods is, in most cases, very considerable; and as it is liable to change very suddenly, great caution is required on the part of the underwriters."

The first remarkable peculiarity in Marine insurance is, that while Fire and Life Insurances are usually effected by companies, Marine risks are commonly guaranteed by individuals. London and Liverpool are the only towns in England in which public companies exist for protecting property exposed to the perils of the seas. It has been asserted, that the comparatively small amount of business done by the Marine companies offers a fair argument that individuals are better adapted to insure sea risks than societies. A little consideration, however, will prove this inference to be incorrect; since a well-constituted company must certainly possess larger means than any single individual, for offering a sufficient guarantee to the insured, and must likewise afford greater facilities in making the contracts, and in promptly liquidating the contingent claims. The mode of conducting the business of Marine Insurance, both by individuals, and companies, in London, is as follows:—

The individual underwriters meet in a subscription room at Lloyd's. The joint affairs of the subscribers to these rooms are managed by a committee chosen by the subscribers. Agents are appointed in all the principal ports of the world, who forward, regularly to Lloyd's, accounts of the departures from and arrivals at their ports, as well as of losses and other casualties; and, in general, all such information as may be supposed of importance towards guiding the judgments of the underwriters. These accounts are regularly filed, and are accessible to all the subscribers. The principal arrivals and losses are, besides, posted in two books, placed in two conspicuous parts of the room; and also in another book, which is placed in an adjoining room, for the use of the public at large. Many of the merchants of the city of London are subscribers to these rooms; and the two old companies contribute each £100 per annum, in return for which they are furnished with copies of the daily intelligence. The rooms are open from 10 o'clock in the morning till 5 o'clock in the afternoon, but the most considerable part of the business is transacted between 1 and 4. Those merchants and ship owners who manage their own insurance business, procure blank policies at the government office, or of their stationers, which they fill up so as to meet the particular object in view, and submit them to those underwriters with whom they are connected; by whom they are subscribed or rejected. Each policy is handed about in this way until the amount required is complete. The premium is not paid to the underwriter in ready money, but is passed to account. Nor does the underwriter debit the account of the person to whom he subscribes a policy, with the whole amount of the premium, but with the premium less five per cent. Whenever losses occur which more than absorb the premiums on any one account, the underwriter is called upon to pay the balance. But should the underwriter's account be what is called good, that is, should the premiums exceed the claims, he sends round during the spring and summer, to collect from his various debtors either the balance of his last year's account, or money on account, according to his judgment; but, upon what he receives, he makes an allowance of twelve per cent. Many merchants and ship owners do not transact their own insurance business. They give their orders for insurance to others, who undertake it for them, and are responsible for its proper management. These latter persons are called insurance brokers; and some of them manage the business of a number of principals. To them, likewise, are transmitted the orders for insurance from the outports and manufacturing towns. They charge the whole premium to their principals, and their profit consists in 5 per cent. upon the premium, 12 per cent. upon the money that they pay to the underwriters, and ½ per cent. that they deduct from all the claims which they recover from the underwriters. It will at once be seen, that the trouble of effecting insurances at Lloyd's is considerable; that a good deal of time must be consumed; and that merchants and ship owners, therefore, have great inducement to consign their insurance business to brokers. But where the business is transacted with a company, this inducement, if not destroyed altogether, is, at all events, very much diminished. Any party having property to insure, has merely to go to the manager of the company, and state the particulars of the risk to be insured; the premium being agreed upon, the manager writes out a memorandum for the policy, which the party signs, and he is thus effectually insured. The companies procure the stamp and write out the policy, which is ready for delivery in four or five days. The companies, like the underwriters, charge the premium less 5 per cent. In other respects they vary. The Royal Exchange Assurance company allow 12 per cent. upon the profitable balance of each year's premiums, with credit till March for the premiums of the preceding year, and 5 per cent. for prompt payment. The Alliance Marine Assurance company allow 12 per cent. upon the profitable balance of each year's premiums, with credit till March; or 10 per cent. for prompt payment. The Indemnity Mutual Marine Assurance company allow 12 per cent. upon the profitable balance of each year's premiums, with credit till June; or 10 per cent. for prompt payment. The allowances of the London Assurance company are the same as those of the Indemnity. Losses are paid at all the offices promptly, and without deduction. A month's credit is allowed to the underwriters; and another month, and sometimes two months, are given to the broker, to collect from the underwriters, and pay over to his principals.

Marine Insurance guarantees no protection from losses arising from the acts of our own government; from any and every breach of the revenue laws; from breaches of the laws of nations; from the consequences of deviation from the understood time and course of sailing; from the sea-unworthiness of the vessel; or from unusual protraction of the voyage. Another description of loss against which the insured are not protected, is described in the following clause of the policy:—"Corn, fish, salt, seed, flour, and fruit, are warranted free from average, unless general, or the ship be stranded; sugar, tobacco, hemp, flax, hides, and skins, are warranted free from average, under 5 per cent., unless general, or the ship be stranded; and all other goods, also the ship and freight, are warranted free from average under 3 per cent., unless general, or the ship be stranded." Average is a name applied to certain descriptions of loss, to which the merchant and ship owner are liable. There are two kinds of average, general and particular. General Average comprehends all loss arising out of a voluntary sacrifice of a part of either vessel or cargo, made by the captain for the benefit of the whole. Thus, if a captain throw part of his cargo overboard, cut from an anchor and cable, or cut away his masts, the loss so sustained, being voluntarily submitted to for the benefit of the whole, is distributed over the value of the whole ship and cargo, and is called "general average." Particular Average comprehends all loss occasioned to ship, freight, and cargo, which is not of so serious a nature as to debar them from reaching their port of destination, and when the damage to the ship is not so extensive as to render her unworthy of repair. Losses where the goods are saved, but in such a state as to be unfit to forward to their port of destination, and where the ship is rendered unfit to repair, are called "partial or salvage loss." The leading distinction between particular average and salvage loss is, that, in the first, the property insured remains the property of the assured—the damage sustained, or part thereof, as the case may be, and as will be hereafter explained, being made good by the insurer; and in the second, the property insured is abandoned to the insurer, and the value insured claimed from him, he retaining the property so abandoned, or its value.

The losses for which compensation is guaranteed are thus stated in the form of policy executed at Lloyd's:—"Touching the adventures and perils which we, the assurers, are contented to bear, and do take upon us in this voyage: they are of the seas, men of war, fire, enemies, pirates, rovers, thieves, jettisons, letters of mart and countermart, surprisals, takings at sea, arrests, restraints, and detainments of all kings, princes and people, of what nation, condition or quality soever, barratry, (*illegal or dishonest conduct*) of the master and mariners, and of all other perils, losses and misfortunes, that have or shall come to the hurt, detriment or damage of the said goods, and merchandizes, and ship, &c., or any part thereof; offences against the revenue of the United Kingdom of Great Britain excepted."

We must pass over the minor details of Marine Insurance, and proceed to the second branch of our subject,—Fire Insurance.

Fire Insurance is a contract of indemnity, by which the insurer, in consideration of a certain premium received by him, either in a gross sum or by annual payments, undertakes to indemnify the insured against all loss or damage he may sustain in his houses or other buildings, stock, goods, and merchandise, by fire, during a specified period. Insurances against fire are hardly ever made by individuals, but almost always by joint stock companies, of which there are several in all the considerable towns throughout the empire. Of these, the Sun, the Phœnix, the British, &c. insure at their own risk and for their own profit; but there are others, which are called *contribution societies*, in which every person insured becomes a member or proprietor, and participates in the profit or loss of the concern. The Hand in Hand, Westminster, &c. are of this description. The conditions on which the different offices insure are contained in their *proposals*, which are printed on the back of every policy; and it is in most instances expressly conditioned, that they undertake to pay the loss, not exceeding the sum insured, "*according to the exact tenor of their printed proposals.*" Nothing can be recovered from the insurers, in the event of loss, unless the party insuring had an interest or property in the thing insured at the time when the insurance was effected, and when the loss happened. It often occurs that no one office will insure to the full amount required by an individual who has a large property; and in such a case the party, to cover his whole interest, is obliged to insure at different offices. But, in order to prevent the frauds that might be practised by insuring the full value in various offices, there is, in the proposals issued by all the companies, an article which declares, that persons insuring must give notice of any other insurance made elsewhere upon the same houses or goods, that the same may be specified and allowed by indorsement on the policy, in order that each office may bear its rateable proportion of any loss that may happen; and unless such notice be given of each insurance to the office where another insurance is made on the same effects, the insurance made without such notice will be void. Any trustee, mortgagee, reversioner, factor, or agent, has sufficient interest in the goods under his custody, to effect a policy of insurance, provided the nature of such property be distinctly specified at the time of executing such policy. Most of the offices except in their proposals against making good any loss occasioned by "invasion," "foreign enemy," "civil commotions," &c.; and under this condition the Sun Fire Office was exonerated from the loss occasioned by the disgraceful proceedings of the mob in 1780. The risk commences in general from the signing of the policy, unless there be some other time specified. Policies of insurance may be annual, or for a term of years at an annual premium; and it is usual for the office, by way of indulgence, to allow *fifteen* days after each year for the payment of the premium for the next year in succession; and provided the premium be paid within that time, the insured is considered as within the protection of the office. Insurances are generally divided into *common*, *hazardous*, and *doubly hazardous*. The distinguishing characteristics of these may be learned from the subjoined proposals of the Sun Fire Office. The charge for insuring property of the first description is now usually 1s. 6d. per cent., the second 2s. 6d., and the third 4s. 6d. These charges are exclusive of the duty payable to government, of 1s. on the policy, and 3s. per cent. on the sum in the policy.

The details of Fire Insurance are so generally known, that it is unnecessary to extend this article by stating them at greater length.

Under the articles *Annuity*, and *Expectation of Life*, will be found all that is necessary to explain the elements of *Life Assurance;* in this place, therefore we shall do little more than treat of the insurance of sums payable at the death of the insurers or their nominees.

Life Insurance. Suppose an individual of a given age wishes to insure £100 payable at his death, the single premium, or the series of annual premiums, he ought to pay an office for such insurance, must plainly depend on the expectation of life of such individual, and on the rate of interest or nett profit which the insurers may make by investing the premiums. With respect to the first of these conditions, or the *expectation of life*, it is usual in estimating it to have recourse to Tables framed from the mortality observed to take place in particular cities or districts; but though the actual decrement and expectation of life among an average population, at every year of their lives, were accurately determined, it is doubted whether it would form a fair basis for an insurance office to proceed upon; for insurance offices invariably profess to act on the principle of rejecting bad lives, or of making them pay a proportional increase of premium; and it may besides, be fairly presumed that persons insuring their lives are of a superior class, and are not, generally speaking, engaged in those manual and laborious occupations that are esteemed most injurious to health. But, on the other hand, the friends of parties whose lives are supposed to be bad, and the parties themselves, are most anxious they should be insured. And since the competition among the different offices became so very keen, as it has been of late years, there are but few lives so bad that they will not be taken by one office or another; and we doubt, were the results of their experience made public, whether it would be found that there is much foundation for the opinion as to the superiority of insured lives. With respect to the second condition in valuing an insurance, or the rate at which the interest of money may be estimated, it is impossible to arrive at any thing like accurate conclusions. At an average, perhaps, transactions in life insurance may extend over a period of thirty years from the time when they are entered into; and in such a lengthened term the greatest changes may take place in the rate of profit and the rate of interest. Mr Finlaison, of the national debt office, appears to think that 4½ per cent. may be taken as the true average rate in this country; and that 4½ is a rate at which no loss need be apprehended. But this is not a point on which previous experience can be safely depended upon in forming engagements for the future; and there are grounds for concluding that no institution, intended to last for the next half century, would be warranted in reckoning upon realizing more than 3 per cent. upon its investments. Security being the principal object to be aimed at by every insurance office established on sound principles, they would not act wisely, if they did not calculate their premiums considerably higher than may appear necessary to those who look only at what has taken place during the last thirty or forty years. Societies contracting prospective engagements that may extend for half a century or more, are exposed to innumerable unforeseen contingencies; and they would be highly censurable, and altogether unworthy of the public confidence, were they so to conduct their affairs, that they might be liable to serious embarrassments from fluctuations in the rate of interest, or an increase of sickness, or any other cause.

Life insurance companies are divided into three classes. The first class consists of joint stock companies, who undertake to pay *fixed* sums upon the death of the individuals insuring with them; the profits made by such companies being wholly divided among the proprietors. Of this class are the Royal Exchange, the Sun, the Globe, &c. The second class are also joint stock companies, with proprietary bodies; but instead of undertaking, like the former, to pay certain specified sums upon the death of the insured, they allow the latter to participate to a certain extent, along with the proprietors, in the profits made by the business. The mode in which this sort of *mixed* companies allot the profit granted to the insured, is not the same in all; and in some, the principle on which the allotment is made is not disclosed. The Rock, Alliance, Guardian, Atlas, &c. belong to this mixed class. The third species of company is that which is formed on the basis of mutual insurance. In this sort of company there is no proprietary body distinct from the insured; the latter share among themselves the whole profits of the concern, after deducting the expenses of management. The Equitable Society, the Amicable, the Norwich Life, &c. belong to this class.

Our limits will not permit us to copy into our pages the terms and regulations of the various Life Assurance Companies now existing; and indeed it is unnecessary to do it, for each society is careful to keep the public mind informed, by advertisements and published reports, on these points. From the great success, however, which has attended the *Scottish Equitable Life Assurance Society*, which is founded on the plan, or nearly so, of the London Equitable, we deem it proper to lay before the reader some slight notice of its nature and operations.

The Scottish Equitable Life Assurance Society is formed upon principles calculated to afford the greatest possible benefits to the assured. It is a Mutual Assurance Society, in which the whole profits belong to, and are periodically divisible amongst, the assured. In this respect, it differs essentially from a proprietary company. In the latter, the profits are in some cases wholly, and in others partly, divided amongst the proprietors, who, as partners, have nothing in common with those who effect assurance with the company. When the lives are carefully selected, and the revenues prudently invested, experience has demonstrated that those profits are greatly beyond what is understood by such as are not intimately conversant with the subject. The numerous Proprietary Life Companies which have arisen,—the exertions made by them to procure business,—the dividends they have been enabled to pay to the proprietors,—and the value of their stock, demonstrate the extent of their profits. Any healthy person, therefore, who finds it expedient to have his life assured, and who resorts to a Proprietary Company, just gives away his share of profits, and he does so without any corresponding advantage whatsoever. For though Proprietary Companies hold it out as an inducement to join them, that they secure to the assured the sum specified in the policy, whether profit be made or not, this is merely a nominal advantage, the fact being, that in every established life office, large profits have arisen. Such has been the result, partly because human life is ascertained to be of much greater duration than is assumed in those calculations, on which all well-conducted life institutions have cautiously and very properly proceeded, and partly because money can, by transactions in redeemable annuity, and otherwise, be improved to greater advantage, than the rate of interest assumed in such calculations. No Proprietary Company, therefore, can possibly afford so great advantages as Mutual Assurance Societies do; for such societies, by dividing the whole profits amongst the policy holders, assure the greatest possible sum at the lowest possible rate. In other words, they assure at prime cost. Accordingly, if it be said of any Mutual Assurance Society, that its rates are too high, it is an obvious answer, that, granting they are so, it does not form a good reason for joining a Proprietary Company in preference to such a society, because all moneys beyond what are absolutely indispensable for securing payment of the sums assured, are returned or compensated to the contributors, either by corresponding additions to the sums specified in the policies, or by making a corresponding diminution of the future annual contributions or premiums. The great practical effect, in short, of the premiums being somewhat beyond the risk, is to create an additional guarantee for the stability of the institution.

The London Equitable, on the principle of which the Scottish Equitable was instituted, is well known throughout the empire, and the profits which it has divided, are familiar to every one acquainted with life assurance. In some cases, the bonuses or divisions of profit have extended to more than four times the sum assured,—an immense advantage, the whole or the greater portion of which would have been lost to its members, had they resorted to Proprietary Companies.

The premiums or contributions required by the Scottish Equitable are somewhat lower than those of the London Equitable. It is not, however, on the lowness of the premiums required, that the Scottish Equitable Life Assurance Society puts forth and rests its claim to support. As has already been said, it is of small, or rather it is of no importance to the members of a Mutual Assurance Society, that the premiums or contributions are somewhat more than adequate to the payment of the sums assured, seeing that to the members alone, all the surplus is appropriated. The claim of the society to a decided preference, therefore, is founded on the irrefragable fact, that from the very nature of the institution as it stands, no company, on a different principle, can warrantably offer to the Assured so great advantages as it does.

The recent alteration on the law of the society, introduces triennial in place of septennial investigations, and a more equitable allocation of the profits.

The annexed tables exhibit the progress of the Society from its commencement, and the premiums on which policies are granted:—

View of the Progress and Situation of the Society since its Institution.

	Amount Assured.	Annual Revenue.	Accumulated Fund.
At 1st March 1833,	£164,624	£5300	£6512
Do. 1835,	325,611	11,365	24,661
Do. 1837,	740,462	26,993	56,114
Do. 1839,	1,019,530	37,590	92,816

Premiums for Assurances on Single Lives for the Whole Period of Life.

Age.	Premium.	Age.	Premium.	Age.	Premium.
	£ s. d.		£ s. d.		£ s. d.
14	1 15 5	30	2 11 1	46	3 17 9
15	1 16 5	31	2 12 3	47	4 0 3
16	1 17 6	32	2 13 6	48	4 2 9
17	1 18 6	33	2 14 9	49	4 5 6
18	1 19 7	34	2 16 1	50	4 8 3
19	2 0 7	35	2 17 6	51	4 11 2
20	2 1 6	36	3 19 0	52	4 14 2
21	2 2 5	37	3 0 6	53	4 17 4
22	2 3 3	38	3 2 3	54	5 0 8
23	2 4 1	39	3 3 9	55	5 4 2
24	2 4 11	40	3 5 6	56	5 7 11
25	2 5 10	41	3 7 5	57	5 11 11
26	2 6 10	42	3 9 3	58	5 16 1
27	2 7 10	43	3 11 3	59	6 0 7
28	2 8 11	44	3 13 4	60	6 5 4
29	2 10 0	45	3 15 6		

These premiums are payable yearly; or, in the option of the assured, they may be made payable half-yearly, with a slight increase of the rate.

We conclude this article with an extract from an able paper on Mutual Assurance Societies, which appeared in Chambers' Edinburgh Journal of 23d March, 1839.

"Although there are about sixty Life Assurance Companies and Societies in the kingdom, all of which are constantly making strenuous efforts to attract public attention to the peculiar advantages which they have to offer, it is a fact not less true than surprising, that the number of individuals who have availed themselves of life-assurance in the United Kingdom of Great Britain and Ireland is not much above eighty thousand. Allowing twenty-five millions to be the population of the empire, and five persons to be the number of each family, it would thus appear that not more than *one* head of a family out of *sixty-two* has adopted this means of providing for the helpless beings whom he may leave behind him. If there were other means in abundance of providing for widows and fatherless children, we might be little surprised at this calculation; but when we consider that the case is quite the reverse—that few fathers have property wherewith to provide for a surviving family, that the number connected with the institutions which allow pensions to widows is necessarily small—when we consider, in short, that the great majority of men who have wives and children have nothing but an income depending on their own life and exertions between their families and want—we cannot but conclude that the expedient of life-assurance is either unknown to a large portion of society, or knowingly neglected by them. In either case, a short paper explaining the subject, and enforcing its claims on the attention of husbands and fathers, may be expected to prove in some degree useful.

"Down to a comparatively recent period, life assurance was chiefly conducted on the ordinary principles of a mercantile speculation. A company, possessing a large capital, assured sums payable on the deaths of parties, at certain rates, calculating on a profit from their transactions. The sole advantage of this plan lay in the guarantee afforded by the capital of the company. It has since been found that, by the plan of mutual assurance, all desirable security is afforded, while the profits are divisible among the only parties who have any right to them, the assurers. Mutual Assurance Societies are, therefore, rapidly supplanting Assurance Companies, most of which will probably in a few years cease to exist. In the present paper we propose to confine our attention to the plan of mutual assurance.

"Mutual assurance proceeds on the following simple principles. While it is an indubitable fact, that nothing is more precarious than the life of an individual, seeing that a thousand dangers constantly beset him, it is an equally certain fact, that if we take so large a number as ten thousand persons, or even a smaller number, it is possible to say with almost unerring certainty how many of these will die during the next ensuing year, how many in the next again, and so on, until, at about the age of a hundred, not one person remains. Thus Dr Price of Northampton took 11,650 individuals, whose births and deaths were recorded in the proper books at that town, and found that in the first year 3000 died, in the second, 1367, in the third, 502, in the fourth 335, in the fifth 197, and so on till the last man died at ninety-six. Dr Price consequently assumed that, of any 11,650 individuals who existed in the like circumstances, 3000 would die in the first year, 1367 in the second, and so on. It will be observed that the whole number who die in the first five years is 5401, leaving 6249 then alive: consequently, any one of the 11,650 children, at the moment of birth, had a chance of living five years equal to the proportion which 6249 bears to 5401, or somewhat more than a half. No man could say, at the moment, that any one of these babies would continue alive for three seconds; but yet it was possible to say with some degree of probability that, in the proper circumstances, 6249 of the whole number would live to the commencement of the sixth year. When we go on to an age at which life assurance is more likely to be effected—say 52—we find that, of 100,000 persons who complete this portion of existence, 3044 will die before the end of the ensuing twelvemonth, so that each man's chance of dying in that space of time is in the proportion of 3044 to 100,000, or about three to a hundred. Now, supposing that these 100,000 persons were each desirous of insuring the payment of £100 to his heirs in the event of his dying during this year, it is evident that if they deposit a sum equal to 3044 times £100, that is, £304,400, or about £3 0s. 10½d. each, they will form a fund sufficient for this purpose, leaving nothing over. We have only to suppose a set of persons of different ages depositing each the sum appropriate to his age, and continuing to do so as long as he lives, and we then have the idea of a Mutual Assurance Society in all except *this*—that, generally, instead of paying an increasing sum each successive year, proportioned to the increased risk, it is common to strike a medium in the probable future payments, and pay that from the beginning. Thus, in point of fact, the sum usually required for the assurance of £100 at death, from individuals aged fifty-two, is nearly £5.

"While Mutual Assurance Societies are founded upon this basis, they take, from circumstances, another character in addition to that which they hold out to the public. It may readily be conceived that the calculations of the probable duration of lives are liable to be modified by certain contingencies. From climate, and modes of living, there is more health and better expectation of life in some countries than in others. Even in the same country, from improvements of various kinds, the ratio of deaths to the amount of the living inhabitants may be experiencing diminution, so that a man of thirty has the chance of living several years longer than his grandfather had at the same age. In this country, the annual mortality is considerably less in proportion than it was sixty years ago. Consequently, the calculations of Dr Price, forming what are called the Northampton Tables, and which are above adverted to, although they were formed amongst a comparatively healthy rural population, are no longer strictly true. They calculate the chance of life at each particular age too low, and dictate the taking of a too high premium for assurance; in other words, a man at fifty-two, has not in reality a chance of death in the next year equal to the proportion of 3044 to 100,000, but something less, and he should therefore pay less than £3, 0s. 10½d. to assure £100 for a year. Nevertheless, the most of Mutual Assurance Societies, such as the Equitable of London, and the Scottish Widows' Fund and Scottish Equitable in Edinburgh, proceed upon the Northampton calculations—but for a reason which must be generally approved of. By this plan a considerable surplus takes place, which, at certain intervals, is reckoned, divided, and added to the standing policies, or sums assured, in their respective proportions. It must be evident that this plan, while it adds to the security of the Society, will be perfectly just to all parties, if the divisions of the surplus do not take place at such wide intervals as to leave many policies of short currency unbenefited. The society last mentioned (Scottish Equitable) appears to us to make this justice most certain, as it divides the surplus triennially, being the shortest interval in practice. Now, what is the general result of this adherence to a large calculation of mortality, but that Mutual Assurance Societies become also, as it were, banks for savings? The money deposited there, is not, strictly speaking, parted with. It is put into a stock, where it is sure of being invested to the best advantage—presuming the managers to be honourable and expert men. If the individual die before his proper time, a much larger sum is drawn out by his representatives. If, on the contrary, he live beyond the average, and make payments beyond the amount of the sum originally assured, still, in the long-run, when he dies, his heirs get *not alone that sum*, but *something more*, in proportion to the excess of his payments and the profits made by the investment of the Society's funds, lessened only by his contingent for the expences of the Society. In many cases, where a policy was of moderately long standing, it has been found that the sum originally assured has been doubled, or more than doubled, while the premium, or annual sum paid for assurance, had of course sustained no increase.

"Such being the equitable and beneficial principles on which Mutual Assurance Societies are established, it is clear that they present, to men in the enjoyment of income, but possessing little property, a most suitable and favourable means of providing in a greater or less measure for the endeared and helpless relatives who may survive them. That only about 80,000 persons in the united kingdom should have taken advantage of Life Assurance, being but one in sixty-two of the supposed number of heads of families, surely affords a striking view of—shall we call it the improvidence of mankind, or shall we not rather designate it as their culpable selfishness? For what is the predicament of that man who, for the gratification of his affections, surrounds himself with a wife and children, and peaceably lives in the enjoyment of these precious blessings, with the knowledge that, ere three moments at any time shall have passed, the cessation of his existence may throw wife and children together into a state of destitution? When the case is fully reflected upon, it must certainly appear as one of extremely gross selfishness, notwithstanding that the world has not been accustomed to regard it in that light. If, indeed, it were utterly impossible to provide for a widow and orphans, no fault could fairly be found. And, no doubt, the little blame bestowed by the world on this account is owing to the fact, that, till a recent period, no means of providing for these relatives existed. They were in those days invariably left to the mercy of the public. But that this occasioned many evils we may be abundantly satisfied, from the earnestness with which the founders of Christianity press the duty of succouring the widow and fatherless—one of them representing religion as almost entirely consisting in that benevolent action alone. Assuredly, if there had not been much misery from this cause, there would have been no need for so much urgency on the subject. But if we only consider for a moment how mainly every one is engaged in providing for himself, we must be satisfied of the extreme precariousness of any provision which is expected to come from parties not responsible. It is therefore the duty of every man to provide, while he yet lives, for his own: we would say that it is not more his duty to provide for their daily bread during his life, than it is to provide, as far as he can, against their being left penniless in the event of his death. Indeed, between these two duties there is no essential distinction, for Life Assurance makes the one as much a matter of current expenditure as the other. One part of his income can now be devoted by a head of a family to the necessities of the present; another may be stored up, by means of Life Assurance, to provide against the future. And thus he may be said to do the whole of his duty towards his family, instead of, as is generally the case, only doing the half of it.

"It may be felt by many, that, admitting this duty in full, their income is nevertheless insufficient to enable them to spare even the small sum necessary as an annual Premium for Life Assurance. The necessities of the present are in their case so great, that they do not see how they can afford it. We believe there can be no obstacle which is apt to appear more real than this, where an income is at all limited; and yet it is easy to show that no obstacle could be more ideal. It will readily be acknowledged by every body who has an income at all, that there must be some who have smaller incomes. Say, for instance, that any man has £400 per annum; he cannot doubt that there are some who have only £350. Now, if these persons live on £350, why may not he do so too, sparing the odd £50 as a deposit for Life Assurance? In like manner, he who has £200 may live as men do who have only £175, and devote the remaining £25 to have a sum assured upon his life; and so on. It may require an effort to accomplish this; but is not the object worthy of an effort? And can any man be held as honest, or any way good, who will not make such an effort, rather than be always liable to the risk of leaving in beggary the beings whom he most cherishes on earth, and for whose support he alone is responsible? It may perhaps be thought that we feel strongly on this subject: we own that we do; but if the generality of men saw the case in its true light, they would feel as strongly as we do. They are only comparatively indifferent, because there has as yet been but a brief experience of a system for redeeming widows and orphans from poverty. When Life Assurance is as universally understood and practised as it ought to be, he who has not made such a provision, or something equivalent, for the possibility of his death, will, we verily trust, be looked on as a not less detestable monster than he who will not work for his children's bread; and his memory after death will be held in not less contempt."

IPSWICH; a borough-town in the county of Suffolk, England, sixty-nine miles N.E. from London. It stands on the banks of the river Orwell, just below its junction with the Gipping, from which the town derives its appellation, as in Doomsday-book it is called Gyppesvitz, or Gyppeswic, since altered to Ipswich. It was anciently fortified and encompassed by a ditch and rampart, which were partially destroyed by the Danes, who took and pillaged the place in 991, and again in 1000. A castle is said to have been erected here by William the Conqueror, which was demolished by king Stephen; but the fortifications were renewed in the fifth year of John, when a wall was built round the town, with four gates, denominated from the four cardinal points of the compass; and of this wall a portion is still remaining. The first charter of incorporation was granted to the inhabitants in 1199, by king John; but Edward I., in the thirteenth year of his reign, deprived them of their franchises, which, however, on their subsequently furnishing ships for his service, he restored; and in 1291 granted a new charter, confirming those of John and Henry III. Other charters were granted by succeeding princes, the last being that of Charles II.

The streets of Ipswich are irregularly formed but well paved and lighted with gas. The houses are mostly of ancient date, but have a handsome appearance. Amongst the public buildings worthy of notice, are the town-hall, county-gaol, and house of correction. The free grammar school was founded previous to the reign of Henry VIII. There are likewise several charity schools, and numerous almshouses, besides an institution for the widows and orphans of poor clergymen.

A philosophical society was established in 1818, and, besides a library for the use of the free burgesses, there are a public subscription library, news-rooms, mechanics' institution with library and museum, and a horticultural society. The chief trade of the place consists in the spinning of woollen yarn, in sail-making, and ship-building. The commerce is principally confined to the exportation of corn, malt, cheese and butter, and the importation of timber. Ipswich returns two members to parliament. Population in 1841, 24,660.

IRELAND, Geology of.* (*a.*) Though the geological structure of Ireland is similar to that of England, still the relative geographical position of the various rocks is essentially different. In England the mountain ranges, consisting of the primary and transition classes, are situated near the west coast, and the newer strata are successively accumulated on each other to the east and south, in which directions the country is comparatively flat. In Ireland, on the contrary, the coast is for the most part mountainous, while the interior is flat, and seldom presents hills of considerable elevation. Thus the primary mountains of Antrim, Derry, and Donegal occupy the north and north-west coasts; those of Sligo, Mayo, Galway, and Kerry, the west and south-west. The slate districts of Cork and Waterford form the south and south-east; while the mountains of Wicklow, Louth, and Down, are situated on the east coast.

These mountain-tracts rarely extend more than twenty miles inland; and we find the interior, with trifling exceptions, composed of flat or gently swelling grounds, covered by a rich and fruitful soil. This peculiar conformation of the surface has been the origin of the great number of rivers with which the coasts abound; they have their sources in the neighbouring mountains, whence they flow in short but rapid courses directly into the sea.

The Shannon forms the most striking example of the rivers of the interior, flowing slowly through the flat country. There are several other rivers which have their origin in the central districts, but they are insignificant in comparison with the Shannon. They all exhibit the same sluggish character, and, when the slow current of water is interrupted by any impediment, have the same tendency to flood the flat country, on either side, for a considerable extent.

By far the greater part of Ireland presents a formation of carboniferous or secondary limestone; but as the exceptions are chiefly confined to the coasts, it may be said that almost the whole of the centre of the country offers this feature. The principal exceptions are in the south-west, where coal prevails over the west of the counties Clare, Limerick, Kerry, and the principal part of Cork. In the south-east, graywacke slate extends along the coast from the middle of the county of Waterford nearly to Kingstown. The same slate is again found in the county Louth, and extends over parts of Cavan, Monaghan, Armagh, and Down. Then commences the tabular trap, which extends over the whole of Antrim and the eastern part of Londonderry. The remainder of the latter county, with the principal part of Donegal and Tyrone, presents a formation of mica slate, which also extends over the western parts of the counties of Mayo and Galway. The north-western extremity of Ireland consists almost entirely of granite and quartz. The latter formation is rarely found in any other part of the island; the former only in three districts to any extent. First, in a line running from Kingstown, in the county Dublin, across Wicklow and Carlow, to a short distance beyond the Barrow, separating in the first half of its course the bed of graywacke slate, and in the second dividing the secondary limestone from the slate. The second bed of granite unites the southern parts of the counties of Down and Armagh. The third extends over a considerable portion of the county Galway, westward of the town.

The characteristic feature of the limestone country is flatness, and the soil, with the exception of the boggy districts, is unusually fertile. In many parts most valuable quarries have been opened, and abundance of stone, of very large dimensions, can be procured for every architectural purpose. Beautiful marbles of various tints occur abundantly in different places, more particularly at Kilkenny, Limerick, Galway, Cork, King's County, Roscommon, and Armagh. In some of the schistose districts valuable beds of fine-grained roofing slate have been discovered and opened. The chief of these are situated in the county of Tipperary, on the banks of Lough Derg, on the Shannon; at Glenpatrick, south of the river Suir, in the county of Waterford; and at Valentia island, on the west coast of the county of Kerry. Good veins of slate also occur to the east of Strangford Lough, in the county of Down, in some parts of the counties of Armagh, Monaghan, in Wicklow, Wexford, and the south coast of Cork.

With respect to metallic mines, veins both of copper and lead have been discovered and partially worked in many of the primary slate districts of the counties of Donegal and Galway, and in the granite slate districts of the counties of Down, Armagh, Monaghan, Wicklow, Wexford, Waterford, Cork, and Kerry; also in different parts of the great central limestone district.

At present few of these mines are in operation. Among the copper-mines the most important are those of the vale of Ovoca, in the county of Wicklow, which yield from 10,200 to 12,800 tons a year, varying from £4 to £5 a ton; those of Bonmahon, in the county of Waterford, yielding from 4000 to 5000 tons, at £9 a ton; and those of Allihies, near Berehaven, in the county of Cork, producing from 6000 to 7000 tons at the same price. The two latter are highly productive, and give employment to a considerable number of miners and labourers. The remaining copper-mines are one near Cahirciveen, in the county of Kerry, and two near Cappawhite, in Tipperary, all opened since the commencement of 1837; and the Audley mine at Skibbereen, in the county of Cork.

The lead-mines of Ireland have not latterly been prosperous, and few are at present at work; the most extensive are those at Conlig mountain, near Newtownards, in the county of Down; of Derrynoose, in the county of Armagh; of Lugganure, in the county of Wicklow; and in the limestone district of the county of Clare, at Ballybicky, near Ennis. The quantities produced cannot be stated.

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* Abridged from the Report of the Irish Railway Commissioners.

In Ireland coal occurs in seven distinct localities, which have been called the Leinster; the Slieve Arda, or Tipperary; and the Munster districts, situated to the south of Dublin; the Monaghan, the Connaught, the Tyrone, and the Antrim, to the north of it. The coal consists of two distinct species, non-flaming coal or anthracite, and bituminous or blazing coal. The first, with the exception of two beds of trifling importance which occur in Antrim, are confined to the coal districts, situated to the south of Dublin, while the northern contains bituminous or blazing coal.

The Leinster Coal District is situated in the counties of Kilkenny, Carlow, and Queen's County. It contains seven workable beds of coal, arranged in regular succession, one above the other. The collieries have been worked for upwards of a century, and now produce annually about 120,000 tons of coal and culm. The former is used for domestic purposes and malting, the latter for burning lime. The upper beds, which are the purest, are now nearly exhausted; but three of the lower beds, which are very extensive, have never been worked.

The Slieve Arda, or Tipperary Coal District.—The general circumstances of this district are similar to those of the latter. It has, as far as is known, three beds of coal, the lowest nine inches, and the second and third two feet in thickness. The principal collieries are situated at Colebrook, and at Coolquil, in the neighbourhood of Killenaule. The line of the Main Southern Railway, as proposed by the commissioners, passes through the midst of the limestone valley, situated between the Slieve Bloom Mountain and the Leinster and Tipperary coal districts. It is probable that by a proper construction of the grate, the pure, though dense, non-flaming coal of these districts may be used with advantage for locomotive engines.

The Munster Coal District is perhaps the most extensive in the British empire; it occupies large portions of the counties of Clare, Limerick, Kerry, and Cork, and coal-mines have been partially worked in all those counties. The coal is usually of a slaty structure, much softer than that of Tipperary or Kilkenny, and is therefore almost exclusively used for burning lime. The principal collieries are situated on the north side of the river Blackwater; and at this moment extensive works are being carried on, particularly at Dromagh and Gurteen collieries, ten miles west of Mallow.

From the extent of coal already known in the southern part of this district, no doubts can be entertained of its capability of supplying the country for centuries to come with abundance of culm suitable for burning lime. This circumstance is of the utmost importance to the agriculturists of the south of Ireland, who find lime to be the best manure for raising crops, particularly wheat.

The Monaghan District.—In this locality the coal formation rests upon a small tract of carboniferous limestone, which is insulated in the central graywacke slate district. Hitherto, though many trials have been made, no coal worth working has been met with; only one bed of fourteen inches, one of a foot, and several of inferior thickness, have been discovered.

The Connaught Coal District is situated on the eastern side of Lough Allen, near the sources of the river Shannon, and comprehends portions of the counties of Roscommon, Leitrim, and Sligo. It consists of a group of hills of considerable elevation. The coal occurs in detached basins near the summits of some of the hills: it has never been extensively wrought; and as there is only one workable bed, varying in thickness from two to three feet, it is not probable that many extensive collieries or manufactories will be established in this district. The Arigna iron-works, which are in it, and which are the only works of the kind in Ireland, have been lately at work, and cast-iron of excellent quality can be made there at a moderate expense. The coal, though thin, is well adapted for the smelting of iron; the iron-stone is peculiarly rich, and limestone is abundant in the neighbourhood.

The Tyrone Coal District, which is situated to the north of Dungannon, in the county of Tyrone, though very small, is much richer in valuable beds than any other in Ireland. At present nine workable beds are known, varying from three to nine feet in thickness. At Coal island six beds have been discovered and worked with various success during the last century; but the stratification of the district is so imperfect, and the consequent difficulty and expense of working the mines have been so great, that the adventurers have seldom obtained any considerable profit from them.

The Antrim Coal District is situated on the north coast of the county of Antrim, close to Fair Head, and occupies the country on both sides of that headland. The collieries have been wrought at a very remote period, but at present no coal is raised in the district, owing partly to the difficulty of working to the dip of the old excavations, and partly from the want of a safe harbour for shipping. At the same time it may be remarked that the extent of coal remaining unwrought must be inconsiderable.

It will be perceived from the foregoing statements that Ireland contains abundance of valuable stone, marble, and slate quarries, many of which are at present in successful operation; and that the metallic mines now at work, though limited in number, are very prosperous; and, should the prices of copper and lead increase, much more extensive works will probably be undertaken. Of the bituminous coal-mines of the northern districts it may be said, that they are inferior both in productiveness and purity of coal to those of Great Britain; but that the anthracitous coal districts of the south are sufficiently extensive, and contain abundance of that coal, which, though less agreeable than the bituminous for domestic use, is most valuable in all cases where a strong and steady heat is required.

IRVING, Edward, late minister of the national Scotch church London, was born in the burgh of Annan, Dumfriesshire, on the 15th of August, 1792. His father was a respectable tanner in that town, and became owner of a considerable portion of burgage and landed property in the vicinity. After receiving a good education in his native place, Edward was sent to the university of Edinburgh, and pursued his studies with great application. He excelled in the mathematics so far as to attract the attention of professor Leslie, who, on being applied to for a teacher, recommended him as the fittest person in his class to undertake the mathematical department in an academy at Haddington. At that time Mr Irving had not completed his seventeenth year. He occupied this situation only one year, when he was invited to one more lucrative in a larger establishment at Kirkaldy. At Kirkaldy he, besides, kept boarders, and gave private tuition. This situation he filled for nearly seven years, during which time he completed his probationary terms, and became a licentiate of the church of Scotland. It was here that he contracted the acquaintance of Miss Isabella Martin, daughter of the Rev. John Martin, one of the ministers of Kirkaldy. He engaged himself to this young lady, on the understanding that as soon as he had obtained a living they should be married; an engagement which he fulfilled shortly after he had obtained the living at Cross street, Hatton Garden. In 1819 Mr Irving removed to Edinburgh, uncertain what to do; he determined only to abide henceforth by preaching the gospel, as his true and sole vocation. Preaching one Sunday from the pulpit of Dr Andrew Thomson, of Edinburgh, unknown to him, Dr Chalmers was one of his auditors. It was the first time the Doctor had heard Mr Irving; and he then formed the favourable opinion of him that subsequently led to his appointing him his assistant and colleague in St John's church, Glasgow, During his ministry at that church, he had the offer of a call to a church in Kingston, Jamaica; which he would probably have accepted, but for the interference of his relations. He was also, during that period, offered a living in one of the collegiate churches in Scotland; but that he rejected, on the ground that it was the gift of the patron

It was in the year 1822 that Mr Irving became a resident in the British metropolis. At that period the Caledonian church, in London, had dwindled into insignificance; and the few families which considered themselves as belonging to it found some difficulty in keeping up the public worship statedly. Some person belonging to the denomination, happening to hear a favourable report of Mr Irving's pulpit talents, was induced to suggest to the proper authorities the propriety of endeavouring to prevail upon him to become a candidate for the then vacant pulpit in, what was termed, the Caledonian Asylum, a place of worship situated in Cross street, Hatton Garden. He accepted the invitation, and was introduced to public notice as the assistant of Dr Chalmers. Mr Irving's style and manner of preaching differed widely from every thing that was then to be found even in that immense metropolis. He soon attracted very large congregations by the force and eloquence of his discourses, and the singularity of his appearance and gesticulation. The greatest orators and statesmen of the day hurried to hear him; the seats of the chapel were crowded with the wealthy and the fashionable, and its doors were thronged with carriages. It became necessary to exclude the public in general, and to admit only those who were previously provided with tickets. The stranger who had effected an entrance found himself in a chapel of moderate dimensions, surrounded by the gay, the noble, and the intelligent of both sexes. When every part of the building had become densely and oppressively crowded, the preacher appeared—tall, athletic, and sallow; arrayed in the scanty robe of the Scotch divines, displaying a profusion of jet-black, glossy hair, reaching even to his shoulders, with a singular obliquity in one of his eyes, and a stern calm solemnity of aspect, somewhat debased by an expression indicative of austere and conscious sanctity. His strong northern accent added to his singularity; which was still further increased by his violent and ungraceful, but impressive, gesticulation. His phraseology was not the least remarkable trait; and was among the peculiarities which gave him *éclat* with the public. He expressed his ideas in the language of Milton, Hooker, and Jeremy Taylor. The circumstance of his meeting with Hooker's Ecclesiastical Polity, which it is said he did, when a boy, at a farm-house near his father's, was a memorable incident in his life; as it no doubt gave the peculiar bent and tone to his character, and contributed much to draw forth the powers of his mind. But his exertions were not restricted to his labours from the pulpit—he had scarcely been a year in the metropolis, when he came forth from the press, in an octavo volume of 600 pages, under the singular title of "For the oracles of God, Four Orations—for Judgment to come, an Argument, in nine parts." Such was the demand for this publication, that a third edition was called for in less than six months. It underwent, however, the ordeal of the most severe and extensive criticism.

In May, 1824, the London Missionary Society applied to Mr Irving to preach one of their anniversary sermons; to which request he consented. At an early period of the following year this sermon, filling one hundred and thirty large and closely printed pages, (independent of a dedication and preface, which occupy nearly thirty more,) was published, under the title of "For Missionaries after the Apostolic School, a Series of Orations, in four parts. I. The Doctrine. II. The Experiment. III. The Argument. IV. The Duty. By the Rev. Edward Irving, A.M." The volume was dedicated to Mr Coleridge the poet, with whom Mr Irving had recently formed an intimate acquaintance.

In 1825, Mr Irving preached the anniversary sermon for the continental society, the substance of which he afterwards published in a treatise on the prophecies of Daniel and the Apocalypse, entitled "Babylon and Infidelity foredoomed of God." This work he dedicated to Mr Hatley Frere, brother to the British envoy at the court of Madrid, and one of the noted students of prophecy of what is called the Albury school. In this dedication he acknowledges that until he fell in with Mr Frere, and had access to that gentleman's conversation and writings, the subject was quite new to him. It was about this time that he drew up his Introductory Essay to bishop Horne's Commentary on the Book of Psalms, published in Glasgow, and which appears to be generally considered as one of the choicest products of Mr Irving's pen. In the controversy which occurred among the numerous friends and supporters of the British and Foreign Bible Society, and which at one period threatened the very existence of the society, Mr Irving took an active part; and made himself somewhat conspicuous by a speech which he delivered at the anniversary meeting of the society in 1827. In the same year, he published "The Coming of the Messiah in Glory and Majesty, by Juan Josafat Ben Ezra, a converted Jew," translated from the Spanish. In 1828 Mr Irving preached a Fastday sermon before the presbytery of London, which he afterwards published under the title of an "Apology for the ancient Fulness and Purity of the Doctrine of the Kirk of Scotland." In the same year he contributed to an annual then existing under the name of the "Anniversary," an essay, entitled, "A Tale of the Times of the Martyrs." He also published a "Letter to the King on the Repeal of the Test and Corporation Acts," a measure which he earnestly opposed; and "Last Days, and Discourses on the evil Character of these Times."

It was about the year 1827 that he was first observed to speak in a totally new manner concerning the human nature of Jesus Christ. On the formation in the metropolis of a society for the distribution of "Gospel Tracts," Mr Irving consented to be one of three preachers appointed to preach collection-sermons in aid of the funds of the new institution; and it is said to have been on the delivery of his oration on that occasion that some of Mr Irving's hearers were astounded by his assertion of "the sinfulness of Christ's human nature." In 1828 issued from the press what may be termed his *chef-d'œuvre*, his "Sermons, Lectures, and occasional Discourses," in three closely printed volumes, in octavo, in which his new discoveries in theology were developed at large.

In the spring of the year 1829 Mr Irving paid a visit to his friends in Scotland, and passed some weeks among them. At Edinburgh he commenced a course of "Lectures on the Book of the Revelation." His original calculation was to go through the whole book of the Apocalypse in twelve lectures; but, having completed that number, he found that he was little beyond the threshold of his undertaking, Having added three lectures, the fifteen were issued from the press in parts, the whole making four duodecimo volumes of nearly four hundred pages each, closely printed. About the middle of May, 1829, the annual meeting of the General Assembly of the Church of Scotland took place in Edinburgh; and Mr Irving was solicitous of obtaining a seat in that august assembly, and partaking in their deliberations. An application was consequently made to this effect; but it was rejected on the ground that his bearing the character of a regularly ordained clergyman disqualified him from officiating in that court as a ruling elder.

No complaint of Mr Irving's heterodoxy occurred in the proceedings of the General Assembly on the occasion just alluded to; but the time soon arrived when his obliquities of doctrinal sentiment could no longer be allowed to lie dormant. The subject was taken up by the presbytery of the Scotch Church, in London, in the early part of the year 1830. Mr Irving was charged with heresy; and at a meeting of the presbytery of London on the 29th of November, 1830, the report of the committee appointed to examine his work on Christ's humanity was brought up and read. It charged Mr Irving with holding Christ guilty of original and actual sin, and denying the doctrines of atonement, satisfaction, imputation, and substitution. These charges were substantiated by quotations from the work itself, and confronted with passages from the Scriptures, the Confession of Faith, and the Assembly's Catechism. It would be tedious to pursue the narrative of these proceedings, in detail, from this period to the beginning of the year 1832, by which time Mr Irving's aberrations had multiplied tenfold—insomuch that the trustees of the National Scotch Church in Regent's square found it necessary to prefer charges against their minister, with a view of either reclaiming him from the error of his way, or deposing him from his official station as a minister of the Caledonian Church, in London. On the 2d of May, 1832, the London presbytery unanimously found him guilty. The consequence was that he became dispossessed of his cure, as minister of the National Scotch Church meeting in Regent square. As Mr Irving still continued to be a member of the presbytery of Annan, the General Assembly of the Church of Scotland now called upon that body to institute farther proceedings against him, on the ground of his heretical sentiments; and after the preliminary measures had been gone through, the trial was fixed for the 13th of March, 1833. It excited an unusual interest in every part of Scotland, especially in the southern departments. The result was, however, the same as in the former case; and the moderator of the presbytery of Annan formally pronounced the sentence of deposition of the Rev. Edward Irving from the ministry of the Church of Scotland. On the next morning, Mr Irving delivered a lecture from a tent, nearly opposite the parish church at Annan, to a congregation consisting of seventeen hundred persons; and previous to his departure from Scotland, he preached a number of sermons, in the open air, at Cummertrees, at Dumfries, at Summer hill, at Terregles, &c. On his return to London, he continued the same practice for a considerable time.

The complaint which led to Mr Irving's death was consumption, produced by his laborious and unceasing efforts to propagate the peculiar religious tenets to which he had attached himself. In the autumn of 1834 he went to Scotland, for the benefit of his health. He expired at Glasgow, on the 6th Dec. 1834, under the roof of Mr Taylor, virtually a stranger to him, but who sought his society from a regard for his character. Those who had seen him only within the last twelve months, and had marked his long gray hair, and wrinkled brow, were surprised to learn that he had attained only his forty-second year. His funeral was attended by most of the clergy of Glasgow, and by most of the elders and deacons of St John's parish, in connection with whom he spent probably the most useful days of his life.

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JACKSON, John; an eminent portrait-painter, was born at Lastingham, a small village in the North Riding of Yorkshire, on the 31st of May, 1778. Very early in life, he evinced a capacity for pencilling a likeness; but he was apprenticed to his father's business, that of a village tailor. Whilst yet the term of his indentures was unexpired by nearly two years, finding occasional opportunities for the indulgence of his propensity for the art, he had made some heads in small, which exhibited a talent much beyond what could be expected from one entirely self-taught, with no example of art to refer to in aid of his ardent desire to improve. These attempts fortunately were shown to the family of the late earl of Mulgrave; and this circumstance laid the foundation of that auspicious career which commenced on his becoming the *protégé* of that worthy nobleman; who, with his lordship's brother, the honourable general Phipps, and others of his noble family, were the constant patrons and friends of the painter through life. It was owing to this circumstance that Mr Jackson obtained the countenance of the late Sir George Beaumont, at whose instance, by a subscription fund, the remainder of the term of his apprenticeship was purchased, when he was happily placed in a state of freedom to pursue the bent of his inclination for graphic study; with means much more felicitous than those which usually attend native talent, on its first embarking to explore the wide ocean of taste.

Mr Jackson, having accomplished the term appropriated to the study of drawing, commenced portrait-painter in the metropolis, and obtained much employment. For some years, however, subsequently to this, his portraits in oil obtained for him no great distinction; but his portraits in water colours were universally admired; and his practice in this department was extensive, and productive of a very handsome income. In these, the heads were tastefully drawn, the resemblances were faithfully correct, and, although carefully finished, wrought with masterly spirit. The style indeed was so deservedly popular, that his practice was greater perhaps than that of any contemporary portrait-painter in small. Many of the heads engraved in Cadell's splendid publication, "Portraits of Illustrious Persons of the Eighteenth Century," were from drawings by Jackson. However great the celebrity and the income which Jackson obtained by these performances, many of which were beautiful, he sought distinction in a superior order of art. He felt conscious that by due exertion he might compete with the most celebrated portrait-painters in oil; and relinquishing the practice of water-colours, soon accomplished his object. "He occupies a place," says a writer in the Athenæum, "between the fine, elegant detail of Lawrence, and the vigorous generalities of Raeburn: or, as others word it, though perhaps less truly, he is a disciple of the school of Reynolds, and one of the cleverest of its followers. Where thought and intelligence were required, he readily supplied them; he rose and fell with his subject, and may be considered as one of the most honest of all the children of flattery. He had an uncommon readiness and skill of hand—a rapid felicity of finish, which enabled him to dash off at a few sittings whatever he undertook: his colouring was deep, clear, and splendid; and in this he more resembled Reynolds than any artist since his day."

On the 6th of November, 1815, Mr Jackson was elected an associate of the royal academy; and on the 10th of February, 1817, a royal academician. In the year 1816, he accompanied general the hon. Edmund Phipps in a tour through Holland and Flanders; and in 1819, in company with Mr Chantrey the sculptor, he made the tour of Italy, by way of Geneva, Milan, Padua, Venice, Bologna, Florence, and Rome. At the imperial city he was elected a member of the academy of St Luke. His death took place at his house in St John's Wood, on the 1st June, 1831. He was twice married, and left children. His character was that of an amiable and generous man. Although belonging to the sect of Methodists, he left an altarpiece for the church of his native parish. The subject is, "Christ in the Garden," from Corregio, which he completed shortly before his death.

JAMAICA, (*a.*) This island lies about 900 miles to the west of the Windward and Leeward chain, in latitude 17° 35′ to 18° 30′ N.; and longitude 76° to 78° 40′ W.; and extends 170 miles in length from east to west, and about fifty in its broadest part from north to south. Throughout its whole length there runs a lofty range of mountains, from 7000 to 8000 feet in height, forming a complete barrier between the north and south sides, except where intersected by two defiles, through which communications are established. Each side of the island presents considerable diversity in physical aspect. On approaching the south, the immense mass of the Blue Mountains at once bursts on the view; their summits a succession of abrupt precipices, intersected by deep chasms and gulleys; the lower range crowned with wood, less rugged in their outline, intersected by wider valleys, and ultimately terminating in a long plain, from eight to twelve miles in breadth, which extends from their base to the ocean. On this level tract, or in its immediate vicinity, the principal towns and largest military stations are situated; the soil is of a rich brick-coloured mould, exceedingly fertile, and watered by numerous rivers, intersecting it in almost every direction.

On the north side there are few plains or level surface of any extent; the ground rises at once from the sea by a succession of gentle acclivities, separated by wide valleys; the hills are rounded on the top, and studded with thick groves of the pimento tree. These features gradually become bolder in their outline till they join the high range in the centre of the island, where they are covered with immense forests of cedar. The soil on this side is generally a chalky marl, producing a rich verdure, similar to that of an English lawn, and watered by an immense number of rivulets and cascades.

The interior of the island has quite a different appearance from either side, presenting all the varieties of feature peculiar to a highland district; in some parts rugged, difficult of access, and densely wooded; in others spreading out into a wide expanse of table land or elevated plain, from which rise a number of small hummocks, giving a slight undulation to the surface. The ground in such spots is generally clear and open, covered with rich grass, and of a pastoral character. These regions, in which cultivation has made but little progress, are principally used for the rearing of cattle.

As these portions of the island present varieties in physical aspect, so they exhibit a corresponding diversity in climate. On the plains or sea-coast of the south side, the thermometer at noon does not vary more than 8° or 9° throughout the year, its greatest height being about 92°, and the lowest 83°. The mid-day heat on both sides of the island is greatly modified by the influence of the sea breeze, which generally sets in from the eastward about eight or ten o'clock in the morning, increases in force till about two, and declines with the sun, until, on the approach of evening, it is succeeded by the land wind from the mountains. When these winds become less regular, or altogether fail, as is sometimes the case before the rainy season, the atmosphere is exceedingly oppressive to the feelings, though the thermometer perhaps exhibits but little change in the temperature. The quantity of rain which falls throughout the year is about fifty inches.

The high lands in the interior of the island possess a very different climate from that of either side, their great elevation producing a corresponding diminution of temperature, which would be still more perceptible, were it not that the sea breeze, which modifies the heat of mid-day in the low country, does not extend to the mountains, and is even but partially felt at the distance of a few miles from the coast. It is consequently in the morning and evening that the diminution of temperature is most felt in the high grounds; at which periods it sometimes exceeds 25°.

In this island almost any variety of climate may be procured. At a residence 4200 feet above the level of the sea, the range of the thermometer is from 55° to 65°; in the winter it falls even as low as 44°. There the vegetation of the tropics disappear, and is supplanted by that of temperate regions. Showers are common in the interior almost throughout the whole year, but they do not fall with the same violence as in the plains, and the quantity of rain appears to be less. The air is exceedingly humid, subject to dense fogs, and those rapid alternations of temperature peculiar to all mountain regions.

The troops here consist of white and black regiments. Of the former the numbers employed have varied from 1895 to 3285, according to circumstances; the average garrison has been 2578. The number who have died in the course of twenty years has been 6596, exhibiting an average annual mortality of 128 per thousand; and it is rather remarkable that, if the mortality from 1803 to 1816 be taken on the same principle, it amounts to 127 per thousand, so that the climate has presented exactly the same fatal character ever since 1803. Even so far back as 1655 the deaths among the troops during the sickly season amounted to 140 per week, and, some years later, out of 800 who arrived two-thirds died within a fortnight.

Of the 6596 deaths recorded between 1817 and 1837, the causes and place of disease of 6254 only can be ascertained: the rest consist of accidental deaths, or of those which took place on detachment where there was no medical officer to record the disease.

An investigation into the extent of mortality at each station shows that all are by no means equally unhealthy; nay, some approach in salubrity to the climate of Britain.

The following Table sufficiently establishes this fact, as well as demonstrates the extremely variable character of the climate, by showing the relative influence of mortality in each year, at the principal stations throughout the island.

Out of every 1000 *Troops at the undermentioned Stations, the following proportions have died in each year from* 1817 *to* 1836 *inclusive.*

Years.	Up-Park Camp.	Port Royal.	Fort Augusta.	Spanish Town.	Stoney Hill.	Port Antonio.	Falmouth.	Montego Bay.	Maroon Town.	Lucea.	Average of whole command.
1817	83	39	34	128	97	192	74	89	none	71	88
1818	65	50	33	278	37	89	67	87	10	95	89
1819	501	316	103	68	301	346	130	—	12	79	294
1820	160	58	92	273	50	84	192	—	29	45	153
1821	130	225	44	91	45	219	53	—	26	41	116
1822	443	205	51	242	47	52	117	51	30	76	171
1823	82	83	31	200	25	51	24	—	35	87	65
1824	45	100	81	207	30	194	52	217	38	64	84
1825	341	321	58	399	453	—	184	—	30	178	307
1826	72	94	61	186	18	—	227	—	21	43	80
1827	225	155	280	164	287	94	[illegible]	—	30	30	224
1828	118	18	84	82	37	147	61	212	41	12	74
1829	43	82	70	51	13	233	51	109	15	35	62
1830	120	148	42	124	18	135	86	—	58	350	97
1831	110	34	79	236	174	124	255	—	48	—	133
1832	91	32	24	57	72	185	75	358	67	167	111
1833	78	39	56	67	31	226	70	174	81	35	86
1834	70	107	51	155	35	173	95	121	16	26	93
1835	52	36	70	194	34	117	84	54	[illegible]	25	75
1836	51	9	60	144	21	25	38	348	29	160	61
General Average	140·6	113·1	73·5	162·4	90·2	149·3	102·6	178·9	32·7	84·9	121·3

Jamaica is ruled by a governor, or captain-general, (appointed by the crown), aided by a council of twelve, somewhat similar to the house of lords; and a house of assembly, answering to the home house of commons. The council is generally appointed by the king, through the secretary of state for the colonies, from among the most respectable colonists who are ex-officio justices of the peace. The lieutenant-governor, chief justice, attorney-general, and the bishop, are all ex-officio members of the council, each member of which is removable at the pleasure of his majesty. The Assembly consists of forty-five members, each of the parishes sending two representatives; and Spanish Town, Kingston, and Port Royal, one additional member each; *a representative must possess a freehold of* £300 per annum* in any part of the island, or a personal estate of £3000; an elector must be of age, and possessed of a free-hold of £10 per annum in the parish for which he votes. Persons of colour are now admitted to all the privileges of white persons, and there are no civil disabilities from religious differences. The governor has the title of his Excellency, and is invested with the chief civil and military authority; he is also chancellor, ordinary, and vice-admiral. On his death or absence, the government devolves on the deputy or lieutenant-governor, if there be any; otherwise on the senior counsellor, who rises in rotation to the presidency, and has a salary of £1000 per annum.

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* Such was the law, but it has not been attended to.

The council, who are by courtesy severally addressed in the colonies by the title of Honourable, consists of twelve members. They are appointed by mandamus from the king, and hold their offices during his Majesty's pleasure; but if at any time by death, absence from the island, or suspension, the council should be reduced to less than the number limited by the instructions to the governor, he may appoint as many persons out of the principal freeholders, inhabitants of the island, to be members of the council, as will make up such number; which persons so appointed may act as councillors until they are disapproved, or others are appointed by his Majesty. The governor may, however, suspend any of the members of the council from sitting, voting, or assisting therein, if he find just cause for so doing; but he must, by the first opportunity, signify to the English government any vacancy in the council, from whatever cause it may arise.

The duty of the council is to give advice to the governor or commander-in-chief for the time being, when required; and they stand in the same relation to the governor in the colony as the privy council in England does to his Majesty; they are also a constituent part of the legislature of the colony, corresponding with the British house of peers; and, finally, they sit as judges on certain occasions.

The general assembly are the representatives of, and chosen by, the people, and correspond with the British house of commons, and its utmost duration is seven years. The laws and statutes of England passed previously to the settlement, unless they are from their enactments inapplicable to the local circumstances of Jamaica, apply to the colony. Statutes passed in England since 1728, unless they relate to trade and navigation, are not in force there. The assembly have all the privileges of the house of commons in England; they have the sole power of levying taxes, and the distribution thereof, with the exception of an annual permanent revenue to the crown of £10,000; the salary of the speaker of the assembly is £1000 per annum.

The governor, with the advice and consent of the council, may, from time to time, as occasion requires, summon the general assembly together, and may, of his own authority, adjourn, prorogue, and dissolve it.

The council and general assembly, with the concurrence of the king, or his representative the governor, may make laws, statutes, and ordinances for the public peace, welfare, and good government of the colony, so that they be not repugnant, but as near as conveniently may be agreeable to the laws and statutes of Great Britain. Under the head of *West Indies*, a view will be taken of the results of the recent abolition of slavery there.

JAMIESON, John, D.D., F.R.S., Edin., and F.S.A., Scot., an eminent Scottish antiquary and philologist, was born in Glasgow, in 1758, his father being first minister of the Duke Street Antiburgher chapel there. He himself was educated for the ministry, and for many years officiated as clergyman to a congregation of Antiburghers in Forfar. He was afterwards called to a chapel in Edinburgh belonging to the same body of dissenters, in which he continued for the last forty-three years of his life. His death took place at his house in George Street, Edinburgh, on the 12th July, 1838.

He first came forward as an author in 1789, in "The Sorrows of Slavery, a Poem, containing a faithful statement of Facts respecting the Slave-trade." His only other poetical work is "Eternity, a Poem, addressed to Freethinkers and Philosophical Christians," 1798. In theology and religious matters he published, "An Alarm to Britain; or an inquiry into the causes of the rapid progress of Infidelity," 1795; "Vindication of the Doctrine of Scripture, and of the primitive Faith concerning the Divinity of Christ, in reply to Dr Priestley's History of Early Opinions," 1795, two vols. 8vo.; "Remarks on Rowland Hill's Journal," 1799; "The Use of Sacred History," 1802, two vols. 8vo.; "The Divisions of Reuben," 1805; Important Trial in the Court of Conscience," 1806, 12mo; "The Beneficent Woman, a sermon," 1811; "The Hopes of an Empire reversed, or, the night of pleasure turned into fear, a Sermon on the death of the Princess Charlotte," 1818; "Three Sermons, concerning Brotherly Love," 1819; "Sermons on the Heart."

His great and excellent work, "An Etymological Dictionary of the Scottish Language," was published in two volumes, 4to. 1808, 1809. It illustrates the words in their different significations, by examples from ancient and modern writers; shows their affinity to those of other languages, and especially the Northern; explaining many terms which, though now obsolete in England, were formerly common to both countries, and elucidating national rites, customs, and institutions, in their analogy to those of other nations. It has been long out of print, but he made an Abridgment of it in 1818, in one volume 8vo. A supplement to the original work was published in two vols. 4to. In 1811, he published "An Historical Account of the Ancient Culdees of Iona, and of their settlement in England, Scotland, and Ireland;" in 1814, "Hermes Scythicus, or the radical affinities of the Greek and Latin languages to the Gothic," 8vo.; and still later an "Historical Account of the Royal Palaces of Scotland." Dr Jamieson was a Royal Associate on the Royal Foundation of the Society of Literature, to whose transactions he contributed some papers, as well as to the transactions of the society of antiquaries.

JARROW; a village in the county of Durham, anciently called *Gyrwy*, about half a mile south of the river Tyne, and two miles from South Shields. It was formerly a place of importance, though now consisting only of a few cottages, an ancient church, and the ruins of a monastery. The latter was founded about the year 684, by the abbot Benedict Biscopius, who had before built the monastery of Monk Wearmouth, and who is said to have been the first person that brought the art of making glass into England. Indeed, Monk Wearmouth was distinguished as being the earliest *glazed* church in this country; before this time, the windows were either latticed, or, at best, filled up with fine linen cloth stretched upon frames of wood.

The monastery of Jarrow suffered frequently by fire, and through the violence of the Danes; at the Norman conquest, the church was but a poor thatched hovel, made up of old walls, with a roof of unhewn timber. Bishop Walcher, however, who had been presented to the See of Durham, by William I., assisted in restoring the ruined monastery. He bestowed upon it several neighbouring manors, and excited some monks of Munkchester, (now Newcastle,) to take up their residence in his diocese, Munkchester being then included in the jurisdiction of the earl of Northumberland. The monastery being thus established, and afterwards much increased, both in revenues and numbers, a division took place among the brethren, and bishop William de Carilepho, Walcher's successor, removed the inmates of the establishment to Durham, when it became only a cell to that monastery. Jarrow monastery was dedicated to St Paul, and the monks were of the Benedictine order. The remains, which do not betoken any great extent of the ancient building, are situated on an eminence. The church appears, from the situation of the tower, to have been in the form of a cross, but it has been so frequently dilapidated, that it is difficult to decide this with accuracy. The present structure is part of the ancient building connected with a portion restored in 1783. Jarrow was the birth-place of the venerable Bede.

JEWS, (*a*.) The popular impressions with respect to the character and fate of the Jews are not so distinct as so important a history requires. We know of no divine inflictions; the punishments of individuals and nations are the natural consequences of their conduct; the misdeeds of communities, as well as the sins of individuals, put an end, sometimes for ever, to that quiet which it is the best prosperity of men and nations to enjoy. The founder of the Hebrew nation, acting under the authority of Heaven, had framed a constitution for this favoured people, which prescribed pursuits adapted to their soil and character, guarded them against the excesses of passion, bound up the hands of national ambition, and gave each individual as much freedom as was consistent with the general welfare. It protected the possessions of the rich and the earnings of the poor, encouraged habits of industry, and set bars to violence and corruption. Had the Hebrews been content to sit down quietly under the shadow of these institutions, they would not have had wealth to invite oppression, and would not have lost strength to repel any invasion of adventurers. But they could not understand the wisdom of their law, and disregarded it so completely, that the very book was lost; and when it was accidentally recovered in the reign of Josiah, all hearts were filled with dismay to find how widely they had wandered. Still they were not instructed by experience;—even Hezekiah, one of their best kings, could not resist the strange ambition of displaying his wealth to robbers. The natural consequences followed. As their welfare depended on the observance of their civil system, their misfortunes followed hard upon its violation. Their occasional reformation restored their character and happiness for a time; but the whole tendency of the state was downward; and the inspired prophets foretold, with amazing and awful exactness, all the particulars of its righteous doom. We cannot help thinking, that the national character is too unfavourably represented on this account. The same argument is made use of, by which the friends of Job attempted to convince him that he was more guilty than others, because he suffered more. Their character was not an amiable one; but it will be observed, that the severity of the prophets, as well as of our Saviour, falls not so much on the people, as on those who misled them. A deep and burning spirit of patriotism was their strongest passion; and it cannot be denied, that they exhibited a resolution when their country was in question, which under better guidance might have made them a virtuous people. But under the direction of the Pharisees, it led to fatal results, even to the barbarous murder of Jesus Christ. But it should be remembered, that when John appeared, calling them to repentance and reform, he became their favourite, and their demagogues dared not say a word against him. The same popularity attended Jesus Christ, though his appearance disappointed all their hopes, which for centuries had looked for his coming in the high and commanding majesty of the conqueror and king. It required the most unwearied malice on the part of their leaders, to weaken his influence, and to work them up to that mad excitement, in which they demanded his blood. All this, we think, is implied in the memorable words, "Father, forgive them, for they know not what they do."

We mention this, because there is a prevailing error on this subject, and the sympathies of men are unfairly divided between the Jews and Romans. Josephus, who wrote under the eye of the conquerors, has been too long suffered to mislead men by those representations of the atrocity of the Jews and the humanity of the Romans, by which he endeavoured to cover the shame of deserting a cause, for which his countrymen thought it a privilege to die. Let it be remembered, that whatever might have been the national guilt which brought them into bondage, their rebellion was an effort to be free;—a rebellion, occasioned not by the extortions of Hebrew viceroys, nor the severity of Roman procurators, hard as those evils were for their proud spirits to endure; but, after years of suffering, they rose in a universal flame, the moment an insult was offered to their religion. If any respect is due to patriotic self-devotion, we cannot withhold it from theirs. And it is an evidence of the power which a popular historian has over the moral judgment, that readers in general should so long have sympathised with Hume against the English patriots, and with Josephus against the Jews. For nothing can be more absurd than to look on the Romans with complacency, because they were employed on this occasion, like the barbarian who afterwards overran their empire, as a scourge in the hands of God. It is quite too much to be called on to admire the humanity of Titus, whose heart was not all stone, though it seems that he tortured his wretched prisoners till no more ground remained for a cross to stand upon. The march of their armies was well described as the "curse of desolation;" wherever was found the "carcass" of a fated city, there one might be sure that their "eagles were gathered;" when they spread their pinions, it was like the waving of the death-angel's wing; and yet from our youth, we are taught to bless the name of the ravenous and grasping plunderer, and it is bad taste to give even the alms of compassion to the memory of his victim.

We do not deny that the annals of the Jews abounded in crimes; but we have no idea of bringing the Romans into this contrast, for the purpose of exalting that great pest of the world. Those who measure character by fortune, must remember that the eternal city was at no distant period, compelled to drain the cup she had poured out so liberally for the nations. *Her* temples were overthrown; the tombs on which her great names were written, were defaced by barbarian hands; and, while in every nation there are living memorials of the Hebrew race, there is not one who can trace his heraldry from Rome. It is the duty of all, who would give a right direction to moral feeling, to resist this unhealthy admiration of lawless violence, whether of ancient or modern times. There is no need of recommending these splendid sins; power will always command respect, and the right hand of the conqueror will cast aside moral as well as physical resistance. Still it is not well to keep incense constantly burning on this altar of human blood; for, though these great tyrants of man are not common, all the relations of life are affected by a sentiment, which encourages false ambition, and turns real glory into shame.

The history of the Jews since the destruction of Jerusalem, is truly wonderful, and affords a most striking testimony to our religion. Never was vessel dashed upon the rock into smaller fragments, than the Hebrew nation in that tremendous overthrow; a million of its best lives were sacrificed; all its noblest blood was shed; the temple was ruined from topmost tower to lowest foundation-stone, and a cold and heavy desolation thrown over all the borders of the land. And this was the people, who deemed themselves the favourite sons of God! for whom he had suffered the bright light of prophecy to send its unnatural dawn far into the depth of coming ages; whom he had suffered, though unworthy, to lean so confidently upon his everlasting arm! One would have thought that so profound a calamity would have turned every Hebrew heart to stone. But every thing about this strange people disappoints predictions founded on human nature. Fortresses still existed in Judea, and, though shaken by the thunder of Jerusalem when it fell, held out without a sign of dismay. Masada was the last that fell into the hands of the Romans. They had surrounded it, and at last succeeded in battering down its walls; but when the night brought a pause to the combat, the Jewish leader assembled his comrades and told them that God had forsaken his people; still he was more merciful than the Romans, and he proposed that they should fire the city, and offer themselves, their wives and children, as a last burnt offering upon a glorious altar. They approved his counsel; embraced their wives and children with tears, and then stabbed them to the heart. Having chosen ten of their number by lot as executioners, they embraced the corpses of their loved ones, and submitted their necks to the blow. The ten then cast lots; and when nine had fallen by each other's hands, the last survivor set fire to the palace, and drove the sword into his own heart. When the Romans entered the city, they were affrighted at the desolation. Savage and horrible as such self-devotion is, it is impossible not to admire the strength of heart which it discovers; and, without inspiration, one might foretell, that so long as a solitary heart of this description was left to beat, it would treasure its national distinction as its sole remaining pride.

Thus, in truth, it has been in every country under the sun. They were scattered to the four winds, like the ashes of their temple; and now the keel of the adventurer can hardly reach a shore, where the Jews have not been before him. Gain is the only avenue to power which their feet are permitted to tread, and they walk in it with an industry that never sleeps. Unsocial as they are, go where they will, they adapt themselves with wonderful flexibility to the habits of the people. To a certain extent they mingle with others in the intercourse of life; but there is a veil in their hearts, like that of the temple, never lifted; a sanctuary, into which the eye of no Gentile is permitted to look. There is no region in which they cannot make themselves a home; and yet they draw a line broad and deep between themselves and others, by keeping up their ancient usages, circumcision, abstinence from unclean meats, and all animal food which has not been killed by a Jew, by assembling in their synagogues, and there worshipping God in the language of their fathers. They are at home, and yet are exiles; familiar, and yet strangers; content with an unenviable lot in the land of their adoption, and yet constantly looking over its boundaries to their own holy land; having every thing to humble and depress them, and yet looking forward with triumphant hope to a time, when the coming of the Messiah, "like the lightning shining from the east to the west," shall shiver and melt their chains.

It is impossible to tell when and how the scattered fragments of the Jewish nation were collected and bound together; but not long after the fall of Jerusalem, we find two Hebrew communities; the one on the other side of the Euphrates, under the prince of the captivity, the other on this side the river, under the patriarch of the West. The school of Jamnia, which pretended to be the Sanhedrim saved from the general ruin, obtained great authority; and, as it was principally spiritual in its pretensions, it did not excite the jealousy of the Romans. It is curious to see how a gradual, but unconscious preparation had been made for a monument of this kind, flattering to the pride of the Jews, but as useless in itself as the fabled pillars that survived the flood. The priesthood had been gradually superseded in the course of ages. The authority of tradition overshadowed that of scripture, and the interpreters of this new volume acquired unbounded influence. At the same time, the worship of the synagogue grew up in place of that of the temple; so that when the ruin seemed complete, a new worship and new priesthood were already created to their hands. Even this was enough to give them a feeling of strength; and before the generation that saw the fall of Jerusalem had passed away, the whole body of Jews west of the Euphrates rose, in a fire that spread at once into a conflagration, and was only extinguished with the loss of six hundred thousand men. The emperor then issued edicts meant to destroy their race; but at this moment, apparently so uninviting, a pretended Messiah, calling himself the "Son of the Star," appeared; set up his standard in Jerusalem, and the Jews poured in by thousands, with a spirit unbroken by disaster, ready to make a new appeal to arms. But their king was slain; the plough passed over the fresh ruins of the city, and all Jews were forbidden to come near it again.

But even then, when Jerusalem was left a city of the dead, and for the third time since our Saviour's prophecy, "the mountains were melted with their blood," their courage and faith endured. Not sixty years after, we find a patriarch at Tiberias in this very region, whose authority was acknowledged by all west of the Euphrates, while the prince of the captivity still held his melancholy state upon the eastern side. He, too, had suffered his share; and at the very moment when the Roman power was about to crush him, the accession of a new emperor drew off its armies, and left his dominion like a ship-wrecked vessel, saved by the sinking of the tide. In this patriarchate at Tiberias, there was no power but such as was conceded to it by public opinion;—but its legates visited all the Jewish establishments in various lands, and received the tribute, which was regularly paid. Such was the force of this Rabbinical dominion, that for a time, the prince of the captivity submitted to its power. One of these patriarchs, in the third century, was the author of the celebrated Mishna, or code of traditional law. The western prince again recovered his ascendency, and governed in Babylonia with the splendour of a king. In the schools of his dominion, comments were made on the law and the Mishna, which were embodied in the Gemara; the Mishna and Gemara together make up the well known Babylonian Talmud. This Rabbinical lore has been extremely unfortunate for the Jews; it has weighed upon them like a millstone, and prevented their entering the lists of intellectual glory. In fact, all their apparent prosperity at this time was a calamity, because it served to draw upon them the attention of the world.

The patronage or opposition of the emperors could not do much to uphold the faint shadow of a state which the patriarchate presented. It was nothing more than a standard floating on a dismantled tower. Both the patriarch and the prince of the captivity seemed to be upheld by a feeling of national pride, without any substantial authority, and without any thing to sustain them in the changes of the world; so that even before the barbarians flowed in upon the Roman empire, the patriarchate had gone down. The principality, being out of the path of revolutions, escaped till the tenth century, gladdening the hearts of the Jews with the sight of its hollow glories, but all the while wearing away. We may say on the whole, that the dark ages found the Jews nearly where the fall of Jerusalem left them; they had not yet found a resting-place in the world.

While the Jews were suffering every thing under the Christian emperors, rather than give up the least observance of their religion, the Samaritans were more disposed to bow their heads to the storm. They eluded the severe laws of Justinian, by submitting to baptism as a matter of necessity, and then quietly returning to the faith of their fathers. We have never been satisfied with the prevailing opinion, that the Samaritans are the descendants of the idolaters (introduced by Esarhaddon) who gradually adopted the religion of the land. We do not think that scripture requires us to believe that the ten tribes were so completely rooted out. The Jews from their prescriptive hatred of the rival house of Israel, always represented the Samaritans as Cutheans, but their evidence must be admitted with caution in a case of the kind. It is admitted that a remnant escaped; and it would seem that it was large enough to keep up the old religion of the land. In our Saviour's time they were expecting the Messiah, and though he was reserved in declaring to the Jews that he was their expected king, he announced it without hesitation to the Samaritans; and if he charged them with "worshipping they knew not what," the charge would apply with equal force to the Jews, who believed in the sacredness of their temple with the same superstition. It is singular, that after the persecution of Justinian, they were almost lost to history for ages, till at last, in the seventeenth century, a remnant, like the mutineers of the Bounty, were discovered on the side of their own holy mountain. There they had looked securely down upon the changes of the world, preserving their ancient religion, and treasuring most of all the scriptures in the Samaritan or old Hebrew character. The Jews during their captivity had borrowed the Chaldean letters. From their correspondence with Scaliger, in reply to his inquiries, they seem to observe the law of Moses with more strictness in many points than the Jews themselves.

When the Mussulman crescent rose in the east, it turned the tide of human affairs in favour of the Jews. Mahomet was very desirous to make the Jews his converts; and as he acknowledged Moses as a prophet, insisted upon circumcision, and made the unity of God the chief doctrine of his religion, they were disposed to favour him against the Christians. They must have seen too, that his armies were likely to prevail, led on by such chiefs as Khaled, who, when advised to repose a moment from the weariness of a day of battle, replied, "There is rest enough in the world to come." But Mahomet required too much of the Jews. He wished to make them disciples as well as partisans, and failing in his attempts, he became their enemy, and persecuted them to the end of his days. But they fared better with his successors, who required no such impossibilities; and it was not without satisfaction, that they saw Omar take Jerusalem from the Christians. Even when he built the mosque which bore his name upon the ruins of their temple, they found consolation in the thought, that the Christians were effectually humbled. Some writers have thought, that a wide conspiracy in favour of the Mahometans was formed among the Jews; but their character is proof enough that they engaged in no such alliance. The natural union of interest and feeling was all that was needed; and we must say, though it is not to the honour of human nature, that nothing binds human hearts so firmly together as hatred to a common foe.

The conquests of Mahomet set the whole world in motion for several centuries. His successors having acquired the thirst of adventure, were not content with the quiet possession of Arabia and Syria; they poured like a flood into Egypt, and swept along the whole southern coast of the Mediterranean; they then passed into Spain, where they established an empire, and as if nothing could set bounds to their enterprise, penetrated into the heart of France. The Saracens also insulted the declining majesty of Rome. But almost every step of their desolating march was over a Christian nation; the pride of the Christian world was deeply wounded, and two or three centuries after, we find the whole Christian world in motion along the northern shore, to avenge the injuries of the cross. The whole course of this revolving circle, had an important bearing upon the interests of the Jews. They are supposed to have had an agency in bringing about the first invasion of Spain by the Saracens, in which Roderick lost his life and crown; an agency, however, which was fully justified by the cruelty they endured from the Gothic kings. These troubled times brought them into notice. Their superior intelligence and education made it necessary to give them offices of profit and trust; and when Charlemagne determined on sending an embassy to Haroun al Raschid, one of this race was employed to represent the European sovereign, and to conduct the diplomatic intercourse between Bagdad and Aix-la-Chapelle.

The conquest of Spain by the Moors, and the establishment of Charlemagne's great empire, were circumstances which threw a gleam of light upon the dark current of the Jewish history; and we are thus particular in allusion to them, because in that age, the Jews fixed that character which they retain at the present day. They did not lose the opportunity; but exerting themselves with their usual sagacious and untiring industry, they became rich;—every stream of commerce in every nation flowed with golden sands for them. In France they took a high stand, and in Spain they were hardly distinguished in wealth, honour, and trust, from their Saracen masters. But the natural result was, that when the wild spirit of chivalry began to prevail in the world, ruling in the hearts of men by maxims with which morals and humanity had very little to do;—the fortunes of the great were exhausted by martial extravagance, the earnings of the poor were drained by oppression, and as the Jews offered a vast resource to beggarly nobles and princes, their wealth at once became a crime. It was discovered that they were guilty of the murder of our Saviour nearly a thousand years before, and for this, it was but reasonable that they should be insulted and plundered in every Christian land. The Jews, with their usual still fortitude, prepared not only to meet, but to draw advantage to themselves from the storm. The soldier of the cross must have his arms; and in the excitement of the moment, the crusaders were ready to pledge every thing for gold. But when the time for payment came, they found that their revenues had not been increased by the prodigality of war, and they were obliged to resort to other means to redeem the pledges they had given. The Jews were then exposed to all kinds of violence; their wealth was confiscated, and their persons banished. Philip Augustus and St Louis in France, distinguished themselves by this saintly extortion. In the reign of Richard I. of England, they were exposed to one of the most infamous massacres recorded in history, and passed through repeated changes of hope and suffering under his contemptible successor.[*] England has nothing to boast of in this dark registry. The only ray of mercy and honour that could be seen in all Europe was in Germany, where Frederick II., the most accomplished prince of his age, had penetration enough to see the baseness of the charges brought against them. When informed, according to the usual scandal of those times, that some Christian children had been found in the house of a Jew, murdered in preparation for the passover, "Bury them," was his only reply. Happy would it have been for Europe, if other sovereigns had resembled him; though superstition had a hold on his dominions, it had none upon his mind: even as a crusader, the grandson of Barbarossa effected by peaceable means what others could not accomplish by war, and left a name as enviable among the infidels, as that of Saladin has ever been among the Christians.

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[*] The following interesting account of the destruction of the Jews at York is given by D'Israeli, in his "Curiosities of Literature."

"When Richard I. ascended the throne [in 1189], the Jews, to conciliate the royal protection, brought their tributes. Many had hastened from remote parts of England, and appearing at Westminster, the court and the mob imagined that they had leagued to bewitch his majesty. An edict was issued to forbid their presence at the coronation; but several, whose curiosity was greater than their prudence, conceived that they might pass unobserved among the crowd, and ventured to insinuate themselves into the abbey. Probably their voice and their visage alike betrayed them, for they were soon discovered; they flew diversely in great consternation, while many were dragged out with little remains of life.

"A rumour spread rapidly through the city, that, in honour of the festival, the Jews were to be massacred. The populace, at once eager of royalty and riot, pillaged and burnt their houses, and murdered the devoted Jews. Benedict, a Jew of York, to save his life, received baptism; and returning to that city, with his friend Jocenus, the most opulent of the Jews, died of his wounds. Jocenus and his servants narrated the late tragic circumstances to their neighbours, but where they hoped to move sympathy, they excited rage. The people at York soon gathered to imitate the people at London; and their first assault was on the house of the late Benedict, which having some strength and magnitude, contained his family and friends, who found their graves in its ruins. The alarmed Jews hastened to Jocenus, who conducted them to the governor of York castle, and prevailed on him to afford them an asylum for their persons and effects. In the meanwhile, their habitations were levelled, and the owners murdered, except a few unresisting beings, who, unmanly in sustaining honour, were adapted to receive baptism.

"The castle had sufficient strength for their defence; but a suspicion arising that the governor, who often went out, intended to betray them, they one day refused him entrance. He complained to the sheriff of the county; and the chiefs of the violent party, who stood deeply indebted to the Jews, uniting with him, orders were issued to attack the castle. The cruel multitude, united with the soldiery, felt such a desire of slaughtering those they intended to despoil, that the sheriff, repenting of the order, revoked it, but in vain; fanaticism and robbery once set loose, will satiate their appetency for blood and plunder. They solicited the aid of the superior citizens, who humanely refused it; but having addressed the clergy, were by them animated and conducted.

"The leader of this rabble was a canon regular, whose zeal was so fervent, that he stood by them in his surplice, which he considered as a coat of mail. Their attacks continued, till at length the Jews perceived they could hold out no longer, and a council was called to consider what remained to be done in the extremity of danger.

"Among the Jews, their elder Rabbin was most respected. It has been customary with this people to invite for this place some foreigner, renowned among them for the depth of his learning and the sanctity of his manners. At this time the Haham or elder Rabbin was a foreigner, who had been sent over to instruct them in their laws, and was a person, as we shall observe, of no ordinary qualifications. When the Jewish council was assembled, the Haham rose, and addressed them in this manner—'Men of Israel! the God of our ancestors is omniscient, and there is no one who can say, Why doest thou this? This day he commands us to die for his law: for that law which we have cherished from the first hour it was given, which we have preserved pure throughout our captivity in all nations, and which, for the many consolations it has given us, and the eternal hope it communicates, can we do less than die? Posterity shall behold this book of truth sealed with our blood; and our death, while it displays our sincerity, shall impart confidence to the wanderer of Israel. Death is before our eyes, and we have only to choose an honourable, and easy one. If we fall into the hands of our enemies, which you know we cannot escape, our death will be ignominious and cruel; for these Christians, who picture the Spirit of God in a dove, and confide in the meek Jesus, are athirst for our blood, and prowl around the castle like wolves. It is, therefore, my advice, that we elude their tortures; that we ourselves should be our own executioners; and that we voluntarily surrender our lives to our Creator. We trace the invisible Jehovah in his acts; God seems to call for us, but let us not be unworthy of that call.' Having said this, the old man sat down and wept.

"The assembly was divided in their opinions. Men of fortitude applauded its wisdom, but the pusillanimous murmured that it was a dreadful council.

"Again the Rabbin rose, and spoke these few words in a firm and decisive tone—'My children! since we are not unanimous in our opinions, let those who disapprove of my advice depart from this assembly.' Some departed, but the greater number attached themselves to their venerable priest. They now employed themselves in consuming their valuables by fire; and every man, fearful of trusting to the timid and irresolute hands of the women, first destroyed his wife and children and then himself. Jocenus and the Rabbin alone remained. Their life was protracted to the last, that they might see every thing performed according to their orders. Jocenus, being the chief Jew, was distinguished by the last mark of human respect, in receiving his death from the consecrated hand of the aged Rabbin, who immediately after performed the melancholy duty on himself.

"All this was transacted in the depth of the night. In the morning the walls of the castle were seen wrapt in flames, and only a few miserable and pusillanimous beings, unworthy of the sword, were viewed on the battlements, pointing to their extinct brethren. When they opened the gates of the castle, these men verified the prediction of their late Rabbin; for the multitude, bursting through the solitary courts, found themselves defrauded of their hopes, and in a moment avenged themselves on the feeble wretches who remained.

"Such is the narrative of the Jews of York, of whom five hundred thus destroyed themselves."

The character of the Jews has remained nearly the same to the present day, only varying with the times, not by any wide and decisive change in the prosperity or improvement of the race. But it is needless to dwell upon this period, since it has been set before the public eye in the splendid panorama of Ivanhoe; where we see at a glance the sufferings to which they were exposed, and the fortitude with which they stooped to meet them,—the contempt and hatred with which they were universally regarded, and the power which they contrived to gain notwithstanding,—the low avarice to which they descended, and the traditional enthusiasm inspired by the remembrance of their religion and their holy land. In the delightful vision of Rebecca, perhaps the loveliest portrait the imagination ever drew, we see the gentle firmness formed by long exposure to danger, contrasted in Rowena with the superiority of one who had breathed nothing but the incense of chivalrous adoration; and we fear, that one touch of Sir Walter Scott's pen has done more for this injured race, than justice and humanity in the last thousand years. While we acknowledge the moral taste of Shakspeare in respect to character, and confess that he does not attempt to give the guilty any lasting attraction, we regret that his Merchant of Venice has done so much to associate all that is savage and rapacious with the name of Jew. We cannot blame him for sharing the prejudices of his time, but we certainly are glad that there is a power to correct his errors, and to balance the impression against the Jews which his painting has made, by one in their favour, drawn with equal talent, and from its nature resistless and enchanting.

We are sorry that there is so little to be said of the literature of the Jews. The fetters of Rabbinism have been so closely folded about their minds, as to prevent free and vigorous action. They have had little of the quiet which is most favourable to intellectual exertion, and we take it, that no great literary improvement can be expected from those who are constantly weighed down by the millstone of banishment or bondage. The most remarkable person in this department, who has ever sprung from the race, is the modern Mendelsohn, whose reputation in Germany is thought to have bettered the condition of the Jews. If, however, his opinions were, as we understand them, that the Jews had a revealed law, but no revealed religion beside the law of nature, the Jews must have dreaded his heresy more than they exulted in his success. Their feeling towards him was not unlike that of the Hindoos toward Rammohun Roy, but they forgave him his deism, so long as he did not embrace Christianity.

It is not surprising that a people who have suffered so much by that sickness of heart which arises from hope deferred, should have been exposed to frequent delusion. When they have been so long watching the heavens, ready to believe that every change was a sign of the Messiah's coming, any impostor might calculate upon their easy credulity. Before our Saviour, there were false Christs in great numbers, and since his time the Jews have been repeatedly misled by adventurers. The most remarkable deception of this kind has been practised in modern times. In 1666, Sabbathai Sevi, a person obscurely born, who appeared in Smyrna, took advantage of his remarkable personal beauty to carry on this daring imposture. He formed the design when young, and prepared his way by affecting uncommon self-denial. When the public mind seemed ready for the declaration, he announced himself as the Messiah. The Rabbins resisted him and drove him from place to place, till he reached Jerusalem, where he remained, gathering proselytes, for many years. His declaration excited a strong feeling against him, but one of his most distinguished opposers suddenly falling dead, the accident was interpreted as a testimony of heaven in his favour. Then the glad tidings spread throughout Europe and Asia, that the Messiah was come;—labour was suspended, and the Jews every where waited the call to rise. Meantime Sabbathai found it no easy matter to ride in the whirlwind he had raised. The ardour of his partisans hurried him to Constantinople to confront the Sultan. That monarch made him this fair and reasonable proposal, "that the Messiah should be shot at with three poisoned arrows, and if he proved invulnerable he would himself own his title; if he declined this offer, he must either become a Mahometan or be put to death." Sabbathai was not long embarrassed by uncertainty; he declared himself a Mahometan without any unnecessary delay, and was dismissed by the Sultan with honour instead of contempt. He then supported the double character which he had assumed with such expedition, and his followers were fast going over to Mahomet in imitation of his example, when the Rabbins succeeded in gaining the ear of the Sultan, who imprisoned him in Belgrade, where he died a natural death in his fifty-first year. Gross and obvious as this imposture was, it long survived him, and his followers are said to be found even now in various parts of the world. This shows how ready they are to grasp at any hope, when faith is almost changed into despair, not only by the growth of Christianity, but by their own tradition. This is found in the Talmud in the form of a prophecy by Elijah, that the world is to continue six thousand years;—two thousand years without law, two thousand years under the law, and two thousand under the Messiah's reign. The first expired in Abraham's life, the second when our Saviour really came Such a tradition, unimportant as it is to others, one would suppose would be disheartening to them, when they can only evade it, by saying that the advent is delayed on account of the sins of the world; the very sins which the Messiah was to come in order to take away.

It is a little singular that Cromwell and Napoleon each took an interest in the Jews, and endeavoured to remove the ban which rested upon the race. Such was the prejudice of the day, that Cromwell could do but little in their favour, though the republicans were not zealous against them. Harrington, in his Oceana, recommended the sale of Ireland to the Jews. The necessities of Charles II. and his court, did more than Cromwell's decision, and after the restoration, the Jews crept quietly into the kingdom, where their descendants remain to the present day. Napoleon caused questions to be proposed to the Jews respecting their allegiance to France, and having received the most satisfactory answers, he assembled a Sanhedrim for the purpose of re-establishing the worship of the synagogue in the empire. It is to be hoped, that after the lapse of some centuries, Christian nations will begin to discover, that their prosperity and religion are not secured by absurd systems of exclusion, which, instead of being a safeguard, are only so many challenges to those without, to batter down the walls which shut them out from the rights they inherit from God and nature.

It is not easy to estimate the numbers of a race who are scattered to the four winds of heaven. The returns made to Bonaparte fixed their number at three millions. This is but a small number, compared with former times. In France there are about forty or fifty thousand. They are still excluded from Spain by an ancient law. In Great Britain their number is variously stated, but not exceeding twenty-five thousand.

The protestant reformation wrought a great but not a decisive change in favour of the oppressed Jews; indeed the theological controversy which prepared the way and smoothed the path for Luther's efforts, arose from Reuchlin's efforts in their behalf. We allude to the generous and successful exertions made by that excellent scholar and worthy man, to save the Jewish writings from the flames to which they were consigned by priestly bigots, on the suggestion of the renegade Pfeffercorn; a struggle that can never be forgotten, from the torrent of ridicule with which Hutten overwhelmed Reuchlin's opponents, in the immortal "*Epistolæ Obscurorum Virorum.*" Under the reformed churches the Jews have been partially tolerated, and their privileges gradually increased; but as yet there are some protestant nations, among which England must unfortunately be reckoned, in which they do not enjoy the full privileges of citizens. We say unfortunately, because we think our brief summary has shown, that in every period when the Jews were oppressed, the principles of evil in their creed became prominent and active; but whenever they enjoyed security and protection, the counteracting principles of good began to work a moral regeneration.

The Jews were not ungrateful to the reformation; in the early part of the last century they became the most zealous supporters of the protestant succession; and it is notorious, that when the Jacobites threatened a run on the bank, the Jews, not only of England but the continent, sent in large supplies of bullion to support the credit of the British government.

In the year 1753, the Pelham administration, with a laudable desire to reward Jewish loyalty, and encourage the accession of such a wealthy people to the subjects of the British crown, introduced a bill for the naturalization of the Jews into the House of Lords: it was supported by Sherlock, bishop of London; Secker, bishop of Oxford; and Hayter, bishop of Norwich; three names of which the ecclesiastical annals of England may be justly proud, and it passed through the upper house without opposition. Its reception in the lower house, when first brought down, was on the whole favourable; but the commercial jealousy of some merchants in the city, the resentment of the Jacobites for the efficacious check given to their machinations by the Jews, and the obstinate prejudices of those who prided themselves on preserving the folly of their ancestors, and calling it wisdom, roused a formidable resistance which the ministers should not have ventured to encounter. Appeals were made to the passions and prejudices of the multitude; "no Judaism" became a signal as efficacious as "no Popery" thirty years after; petitions poured in from every quarter; but the ministers, strong in rectitude of principle, resolved to proceed. The ministers persevered and the bill was carried; a general election was at hand, and the opposition unhesitatingly availed themselves of the popular clamour to drive their political rivals from the hustings.

In consequence of the popular excitement, the parliament were forced to repeal the bill in the following year. Other nations outstripped England in the march of liberality; in America, in Holland, in Prussia, and in France, the Jews were admitted to the privileges of citizens, and have proved by their subsequent conduct that they were well entitled to the favour. The Jewish regiment in the Prussian service was the one that acquired most glory in the memorable battles of Ligny and Waterloo. In the year 1829, Mr Robert Grant, then member for Finsbury, brought in a bill for the emancipation of the Jews, but withdrew it after it had made some progress, chiefly because it was deemed imprudent further to shock the prejudices of those who had been so deeply offended by the concession of emancipation to the Catholics. The speakers against the measure, with one exception, rested their arguments on expediency.

JODRELL, Richard Paul, Esq., D. C. L., F.R.S., and F.S.A.; deputy lieutenant and justice of the peace for the counties of Oxford, Derby, Norfolk, and Middlesex; was descended from an ancient family, originally of Derbyshire, and afterwards of Staffordshire. He was born Nov. 13, 1745; and, having lost his father in 1751, lived in possession of his paternal estates for nearly eighty years. He was educated at Eton and at Hertford College, Oxford; and his attachment to his classical studies was evinced by his compositions in the Musæ Etonenses, and by subsequent more laborious publications. To the supplementary notes of Potter's Æschylus, printed in 1778, he was a contributor; in 1781 he published, in two volumes 8vo., "Illustrations of Euripides, on the Ion and Bacchæ;" and in 1790 another volume, "On the Alcestis." The modern drama, also, as well as the ancient, shared Mr Jodrell's attention. "A Widow and no Widow," a dramatic piece of three acts by him, was acted at the Haymarket in 1779, and printed in 1780, 8vo. At the same theatre, in 1783, was performed with success his "Seeing is Believing," in one act, printed in 1786. His tragedy, called "The Persian Heroine," having been rejected by the managers of the two great theatres, was printed in 1786, 8vo. and 4to. In the following year he published "Select Dramatic Pieces; some of which have been acted on provincial theatres, others have been written for private performance and country amusement." He also published in 4to. 1785, "The Knight and Friars," an historic tale, from Heywood's *Γυναικειων*. In 1784 he became a member of the club founded at the Essex Head, for the purpose of cheering the declining days of Dr Johnson. He was elected a fellow of the royal society in 1772, and of the society of antiquaries in 1784. He was created D.C.L., at Oxford, July 4, 1793. At the general election, 1790, he was returned one of the barons in parliament for Seaford; but by the decision of a committee, which was not given until the second session, he was declared not duly elected on the 19th of March, 1792. However, when Mr Sarjent was made clerk of the ordnance, in Jan. 1794, he was re-elected for the same place, but after the dissolution in 1796 he did not again sit in the House. With advancing years, the mind of Mr Jodrell became obscured, and from the year 1822 he gradually sunk, until he reached total and absolute incapacity. He died on the 26th Jan. 1831, aged eighty-five, and left a family.

JOLLY, Alexander, D.D., bishop of Moray; died at Fraserburgh, Aberdeenshire, on the 29th June, 1838, in the eighty-third year of his age, and forty-second of his episcopate. The reputation of bishop Jolly for profound and varied learning extended far beyond the limits of the church of which he was a distinguished ornament. He devoted a long life to the studies of his profession; the whole range of theology was open to him, but the scriptures in their original languages, and the writings of the Fathers, were his familiar food; these he thoroughly digested. The result is partly exhibited in his valuable work on the Eucharist, published in 1831. In 1826, he published a "Friendly Address to the Episcopalians of Scotland, on Baptismal Regeneration," briefly tracing the success and uniformity of the church doctrine on that important subject. In the department of practical divinity, he published, in 1828, "Observations on the several Sunday Services throughout the year." By a late arrangement of the Episcopal college, the See of Moray, founded in the 12th century, exists no longer; the clergy and congregations composing it constitute parts of other dioceses.

JONES, John Gale, a political orator of some notoriety in his day, died in Somers Town, where he had long resided, on the 4th April, 1838, aged sixty-seven. He was by business a surgeon and apothecary, and was bred to that profession by Mr North, of Chelsea. When the breaking out of the French revolution inflamed the conceptions of many politicians in England, he took a lead in the debating societies, where his eloquence and zeal made him a distinguished performer. He was a member of the celebrated "London Corresponding Society." He possessed great powers of declamation, and took an active part in Westminster politics during the period when Sir Francis Burdett rendered himself so conspicuous. His connection with the British forum, where questions of the most ticklish nature were openly discussed, brought him into collision with the House of Commons; he was committed to Newgate, Feb. 21, 1810, for the publication of a scurrilous hand-bill; and after two unsuccessful motions for his release made by Sir Francis Burdett (amended by Mr Sheridan) and Sir S. Romilly, he was only liberated by the prorogation of parliament on the 21st of June, which was the same day that Sir Francis Burdett, by the same circumstance, was released from the tower. In 1810 was published "A Warning to the Frequenters of Debating Societies; being a History of the Rise and Progress of those Societies, with a Report of the Trial and Conviction of John Gale Jones, the Manager of the British Forum."

The following are the titles of Mr Jones's publications:—"Sketch of a Speech at the Westminster Forum, 1794." "A Political Tour through Kent for the purpose of promoting the cause of Parliamentary Reform, 1796." "An Oration on the character of Washington, 1797." "Observations on the Tussis Convulsiva, or Hooping Cough, 1798." "Invocation to Edward Quin, Esq. 1804." "Five Letters to the Right Hon. G. Tierney, 1806." A satirical poem, with notes, on the members of the society of the Eccentrics, published about thirty years ago, gave considerable offence at the time to those whom he lampooned.

His style of speaking was very captivating. His voice was good, and he had words at will; and if, as Mr Fox said, a good speech ought never to read well, his speeches were super-excellent, for, defying analysis, the reporter could make very little of them. The ear, however, was tickled by a concatenation of sweet sounds. We believe one of Sir Samuel Romilly's first efforts was the conducting the defence of Mr Gale Jones, who was tried at the Warwick assizes, about the time Mr Hardy, Mr Horne Took, and others, were tried in London. In private life Mr Gale Jones is described as cheerful, amiable, and unassuming; instructive in his conversation, a scholar, and a gentleman.

JONES, Captain George Matthew, of the royal navy, author of "Travels in Russia and the north-eastern countries of Europe," was brother to col. J. T. Jones, of the royal engineers, the constructor of the lines of Torres Vedras, and the officer who led the attack upon Bergen-op-Zoom. Capt. Jones commenced his naval career under the late Sir J. S. Yorke. He received his first commission in 1802; and was junior lieutenant of the Amphion 32, when that frigate conveyed lord Nelson from off Brest to the Mediterranean, on the renewal of hostilities with France, in 1803. He subsequently assisted at the capture of a Spanish squadron, laden with treasure, from South America bound to Cadiz. On the 8th Nov. 1808, he was severely wounded in a gallant but unsuccessful boat attack on the coast of Istria. On the 27th Aug. 1809, he again highly distinguished himself, at the capture and destruction of six heavy gun vessels, seven trabacolas, and a land battery of four long twenty-four pounders, at the mouth of the Piavie, and in sight of the enemy's squadron at Venice. In Sir William Hoste's official letter on that occasion, "the prompt manner in which lieutenant Jones turned the guns of the battery on the enemy's vessels" was noticed as highly praiseworthy. He afterwards commanded the Tuscan brig, and was employed in co-operation with the defenders of Cadiz, during the siege of l'Isla de Leon, in the year 1811. His last appointment was Jan. 23, 1817, to the Pandora of eighteen guns, on the Irish station, where he remained for a period of nearly two years. He obtained post rank, Dec. 7, 1818. In 1827, Captain Jones published "Travels in Norway, Sweden, Finland, Russia, and Turkey; also on the coast of the sea of Azof and of the Black Sea, &c. &c." in two vols. 8vo. Previously to these travels, which were undertaken by him with a view to the acquisition of professional knowledge, he had already inspected all the naval arsenals and ports of France and Holland; and in this publication he relates the result of his examination of them, as well as of those of Russia, Sweden and Denmark; thereby presenting his readers with a great store of accurate information, and much acute remark, on the amount and condition of the maritime force of most of the European powers. He received the greatest attention from the late and present Emperors of Russia, and from the Empress Mother. Shortly after his travels, he was attacked by a paralysis of the limbs; and repaired to Italy for the recovery of his health. In a state of great debility, he had the misfortune to fall down a flight of steep stone steps at Malta; three of his ribs were broken, and his shoulder dislocated; and on the third day he expired. This took place in 1831.

JUSSIEU, Antoine-Laurent de,[*] the distinguished modern botanist, to whom the science is so much indebted for the *natural* method of classification, was born at Lyons in 1748, and came to Paris in 1765, to complete his medical and scientific studies, under the direction of his uncle, Bernard de Jussieu, (of whom a short notice will be found in the body of the work.) The first years of his abode in that city were entirely devoted to these studies, and he terminated them in 1770, by a thesis for the degree of doctor in medicine. The subject of this thesis, and the mode in which it is handled, show the direction already given to his studies, and the philosophical spirit which animated him at first entering upon his scientific career. That subject was, *An economiam animalem inter et vegetalem analogia?* and it is, in fact, a concise, elegant, and perspicuous exposition of what was positively known at that period respecting the structure and functions of vegetables, and a comparison of them with the phenomena of animal life. The manner in which this question is treated was evidently a brilliant outset for a young man of twenty-two; and when Lemonnier, then professor of botany, became unable to attend at the royal garden, in consequence of the duties entailed on him by his situation as first physician to the king, Bernard de Jussieu proposed his nephew as his substitute, which was agreed to. Antoine-Laurent de Jussieu then devoted himself, with renewed ardour, to the study of that branch of science which he was thus called upon to teach.

The memoir on the family Ranunculi, which he read to the academy of sciences in 1773, proves how speedily he had turned his studies to some account, and how thoroughly his mind was imbued with the excellent principles, which, as above-mentioned, had evidently directed Bernard de Jussieu in his attempts at natural classification. In this memoir, which procured for its author admission into the academy of sciences, and in a second memoir, presented the following year, on the new arrangement of plants in the royal garden at Paris, we find, for the first time, the fundamental principles of the natural method explained with perspicuity and precision. We there find a just appreciation of the grand principles of subordination of characters, and their unequal value; a principle unknown to Linnæus and Adanson, evidently recognized by Bernard de Jussieu, but of which Laurent de Jussieu was the first to perceive the full importance, and he afterwards applied it with singular judgment. Thus, in the first of the above-mentioned memoirs, we find this passage: "We have seen, by some general principles developed in this memoir, the affinity which exists between the parts of fructification; in this affinity different degrees are perceptible: all these characters have not the same value, or the same efficacy in uniting or separating plants. Some are primitive, essential, and invariable, such as the number of the lobes of the embryo, its situation in the grain, the position of the calyx and of the pistil, the attachment of the corolla and stamens; these serve for the principal divisions. The others are secondary; they are sometimes variable, but never become essential, unless when their existence is connected with that of some of the preceding, and it is their assemblage which distinguishes the families."

Such, then, from the date of 1773, were the fundamental principles by which Antoine-Laurent de Jussieu was guided in drawing up the *Genera Plantarum.* They are expressed with much precision; and if he sometimes deviates from them, it may be perceived that he does so as a concession to facility of study, or to the old systems, rather than from real conviction. Thus in the memoir read in 1774 on the new arrangement in the Garden of Plants, he has evidently departed from the rigorous principle of the insertions, as Bernard de Jussieu had admitted them in the catalogues of Trianon, by dividing the dicotyledones into apetales, monopetales, and polypetales; but we have only to read his memoir to perceive, that his only object was to multiply the great classes, and to establish some relations between the new order and the method of Tournefort which it replaced, and which was generally known, not only to the pupils, but to the majority of the botanists of that era. We must not therefore lose sight of the origin of this part of Jussieu's classification when we wish to appreciate the method followed in the *Genera Plantarum*, which does not sensibly differ from it.

From this period up to 1785, Antoine-Laurent de Jussieu always arranged the plants in the botanic garden according to this method. The lists used in his demonstrations, worn out by use, often renewed, covered with notes and additions, and at last presenting not only the list of the genera and species cultivated, but the characters of the families and most frequently those of the genera concisely and perspicuously indicated,—all show that these eleven years were diligently employed in bringing his natural method nearer perfection. From the year 1770, Bernard de Jussieu, now seventy-one years of age, ceased entirely to take any charge of the garden, which he wholly entrusted to his nephew; his health, and particularly his sight, became feeble, and in 1777, after having experienced several attacks of apoplexy, he finished his long career—a career which had in reality so much influence on the progress of botany, although in appearance it had been productive of little.

A comparison of dates will suffice to show what portions of the natural method, as explained in the *Genera Plantarum* of 1789, are due to Bernard de Jussieu, and what to his nephew. The arrangement at Trianon, formed in 1759, proves that the classification of the families according to the cotyledons and the insertion of the stamens, is due to Bernard de Jussieu; Antoine-Laurent de Jussieu, while studying this series, and receiving his early botanical education from his uncle, probably drew up the first principles of the science; but every thing proves that the influence of Bernard de Jussieu on the works of his nephew is limited to this. In fact, Bernard de Jussieu's three note-books relative to the order of the garden at Trianon, contain not a single character either of the classes, families, or genera; there is not even an indication of any of the classes except those of the Monocotyledones and Dicotyledones. In his notes on the cards we find some generic characters accompanied with sketches of the section of the seed; but these cards, carefully preserved by his family, are far from numerous. This method of description on cards was followed by his nephew; they are frequently dated, and amount to a great number in 1774. Finally, the oldest notes used in his demonstrations by Antoine-Laurent, bear the characters of the families, which are not found in any of those belonging to Bernard. Thus the first principles of the classification are due to Bernard de Jussieu, but the profound and sagacious application of these principles and the true institution of the natural families are to be ascribed to Laurent.

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[*] Translated and abridged from a paper by M. Ad. Brongniart, in the *Annales des Sciences Naturelles*, vol. vii.

In 1785, Desfontaines succeeded Lemonnier, and A. L. de Jussieu discontinued his demonstrations as the substitute of the latter. He immediately commenced to draw up his *Genera Plantarum secundum ordines naturales disposita*, which was nothing else than the development of the writings used in his demonstrations, and which he had been bringing to perfection from the year 1774. The materials prepared for the work, may, in fact, be seen in a catalogue of genera, to which is added a list of all the new genera indicated in recent works, and which were to be arranged in their proper order in the *Genera* when completed.

The four years that intervened between 1785 and 1789 were thus employed in digesting the materials which were to enter into the composition of the *Genera*, and in the actual completion and printing of the work. The printing went on as the author drew it up, and yet the successive and definitive completion of the different parts led to no important error, so carefully had the general plan and the series of the genera been previously elaborated.

The fifty years which have now elapsed since the publication of this work, and the numerous investigations of the natural method which have taken place since that period, allow us to regard the opinion of the learned world regarding it as the opinion of posterity, and this opinion is so general and so unanimous in its favour, that it would be fruitless to insist here upon its merit and importance. However, without presuming to form a judgment on what has been already determined by the most distinguished botanists of all countries, we may be permitted to inquire, to what kind of merit the *Genera* of Antoine-Laurent de Jussieu owes the influence it has exercised, not only on the progress of botany, but likewise on that of every other branch of natural history.

Up to the time of the publication of the *Genera Plantarum*, it may be said that the natural method had not entered the field of public inquiry. The series of Linné and Bernard de Jussieu, very incomplete, and merely nominal, had no other effect than suggesting some speculative reflections to men who were in a condition to guess at their principles. The work of Adanson, destitute of general principles, and destroying natural affinities in the majority of cases, was presented besides in a form which necessarily rendered it difficult to consult, and afforded no opportunity for the author to explain the reasons which led him to form such and such relations. Thus from the date of 1763, the time when Adanson's Families of Plants were published, up to 1789—a period of twenty-six years—the natural method had made no progress in the learned world. Neither in France nor in any other country, had it acquired new followers; merely a passing glimpse had been obtained of it; its nature was not yet demonstrated. The *Genera* of 1789 had, on the contrary, a speedy influence on the direction of botanical studies. This influence was not indeed immediate, for the public attention was then turned to events of high importance altogether foreign to science. But at the end of a few years the work had come almost into general use throughout France in public teaching, not only in the instructions of the faculties and the Garden of Plants at Paris, but also in the majority of the central schools, those foci of general and varied instruction which were too speedily destroyed.

Of the botanical works in ordinary use, the Flore Française of Lamarck and of Decandolle, as well as many local floras, were arranged according to this method, and made it more generally known; and scarcely twenty years had elapsed, when an eminent botanist declared himself one of its most devoted champions, and contributed materially to bring it to perfection. Since that time it has spread over Europe, and it may be even said the whole world. Its superiority over artificial methods is generally acknowledged, and the latter are now admitted only in their proper character, namely, as more or less convenient keys for opening a way to the nomenclature of vegetables. We may add, with Cuvier, that the influence of the *Genera Plantarum* is not confined to botany. Every branch of natural history, and zoology in particular, have derived benefit from the principles which guided Jussieu, and which he has so well explained in his admirable introduction; and we are inclined to think that Cuvier, in expressing this opinion, founded it on his own experience, and that the principles alluded to regulated him in the changes he introduced into the zoological system.

To exercise in a gradual and durable manner so positive and generally acknowledged an influence on the progress of science, a work must necessarily unite two different kinds of merit; general ideas of a varied, important, and novel character, and as perfect an application as possible of these principles in all their details. These, in fact, are the qualities we find united in the *Genera* of Antoine Laurent de Jussieu. The introduction, written in the most perspicuous and elegant Latin ever employed on scientific subjects, presents an exposition not only of the fundamental principles of the natural method, but as perfect a view of the structure of vegetables as the existing state of botany permitted. The characters of the classes and families afford an opportunity for applying and developing these principles; and the exactness, perspicuity, and precision of these characters, particularly such as apply to the families, still authorize us, if we keep in mind the period when they were framed, to consider them as models which few authors have equalled, and none surpassed. Finally, the notes appended to the greater part of these families form, perhaps, that portion of the work which most evinces the judgment and extensive knowledge of the author. It was in them that he often corrected the artificial tendency which a linear series always assumes, that he pointed out the multiplied relations of families to each other, and that he indicated the doubts left upon his mind by imperfect observations which he had been unable to verify, or which led to the presentiment of remote affinities, a foresight which greatly outstripped, so to speak, the actual state of the science. Many of the improvements subsequently introduced into the natural method, are in reality, foreseen or indicated either in these notes, or in the sectional divisions of the families, or by a word placed at the end of the generic character. This last part of the work, the characters of the genera, considered by some superficial authors as a simple compilation, is not, in our estimation, the least remarkable feature of it. Certainly the work would have presented, after the characters and notes on the families, a list of the genera comprised in each of these families, as every one has since done who has followed in the same track, and this of itself would have rendered an immense service to the science, and sufficed to elucidate the natural method. Yet, without generic characters, a table of the families would have only been a subject for study and reflection, and would not have been adapted to actual use, nor formed a manual, so to speak, for the botanist; and the natural method would have been disseminated much more slowly among the learned. But in introducing generic characters, it may be asserted that they could not in general be taken by compilation, even from the most esteemed works of the period; for characters simply distinctive, suitable for an artificial system, would often be quite unadapted to a natural method; or a character which might appear trivial to the author of the former, might acquire great importance in the eyes of him who studies natural relations. Accordingly, the characters of the *Genera* have been generally traced by the hand of Jussieu, either after nature, or after the published or manuscript descriptions of botanists in whom he could place confidence, and the mention of the sources from which he has derived them, always enables us to judge of their value. If the characters of the genera, then, are partly a work of compilation, it is a kind of compilation which is indispensable in a production of this nature, and often requires more talent and discernment than direct observations. It may therefore be affirmed that the *Genera Plantarum*, published in 1789, was a work as perfect in its execution as the state of botany admitted of, and this execution is entirely due to Antoine Laurent de Jussieu.

With regard to the principles of the classification, the fundamental basis of the method, they were the same as those explained by the author in his memoir on the series of plants in the garden of Paris; that is to say, the same as those admitted by Bernard de Jussieu, and deduced from the number of the cotyledones, and the relative insertion of the parts of the flower, to which were added such as are derived from the presence and structure of the corolla. The adoption of these characters, as the base of the first classification of the dicotyledones, has perhaps contributed to interrupt the relations which Jussieu no doubt perceived to exist between the apetales and the polypetales, and in some rarer instances between the monopetales and these two last classes. But it is necessary only to refer to the memoir above-mentioned, to perceive that the desire of multiplying the number of the classes, to render the natural method of more easy use, determined the author, in this instance, to depart from what he considered the rigorous principles of his method. If any blame attaches to the author of the *Genera* relatively to the classification he has adopted, it arises from his having made this concession for the purpose of rendering his work of easier application; for it is probable that the characters furnished by the corolla will one day be dispensed with, to a greater or less extent; and this, to appearance, will be the most important modification which the method of the *Genera Plantarum* shall have undergone, although in reality it will merely consist in reverting to the original principles of the author.

The public events which almost immediately succeeded the publication of the *Genera Plantarum*, necessarily diverted the author's attention from his botanical studies. The period which elapsed between 1789 and 1800, was but little adapted to the peaceable study of natural history: Jussieu employed it in rendering himself useful both to his own species and to science, by lending his aid in improving the hospitals, and in organizing the museum of natural history.

In 1790, he was nominated by his section member of the municipality of Paris, and was entrusted, under that title, with the management of the city hospitals; he fulfilled these duties till the year 1792.

In 1793, the garden of plants, or king's garden, was remodelled under the name of the museum of natural history. All the persons appointed, under different titles, to teach or take charge of the collections were raised to the rank of professors, and entrusted with the management of the establishment. M. de Jussieu who, like Vaillant and Bernard de Jussieu, had hitherto been merely a demonstrator, was appointed, with the title of professor of rural botany, to teach that science in the country. He thus shared the task of teaching botany with his colleague Desfontaines; and his herborisations, attended by a crowd of young students and distinguished amateurs, contributed to spread a taste for the study, and to diffuse the enlightened principles which he had introduced into the science; and his followers were predisposed to give a favourable reception to the latter, when they witnessed the simplicity and kindness of him who demonstrated them.

Having been chosen successively by his colleagues to be director and treasurer in the administration of the museum, he rendered important services to the establishment in these capacities, particularly at the difficult period of its reorganization, when, notwithstanding the obstacles which political events often opposed to the prosperity and even the existence of the museum, he found means, by his zeal and activity, to perform services of the highest advantage to it.

He resumed the publication of his botanical researches when the *Annales du Museum* were commenced in 1802. Besides a series of notices on the history of the Museum of natural history, we find in the early volumes of this collection many memoirs on new or imperfectly described genera; or on families which recent discoveries or more exact observations have enriched with new genera. Thus the Amaranthæ, the Nyctagineæ, and the Onagrariæ were successively submitted to a new examination. It may be perceived that his object in these investigations was to bring the *Genera Plantarum* and the natural method nearer perfection; but this purpose became more evident in the fifth volume of the collection, in 1804, when he began to publish a series of memoirs devoted to the examination of the general characters of the families derived from the fruit, and confirmed or rectified by the observations of Gærtner. He mentions at the same time the additions which these families had received since the appearance of the *Genera*, and discusses questionable points of organization or synonymy, always displaying remarkable skill in the examination of obscure genera, often ill described by their authors, and whose structure he refers to their true type with singular discrimination, as appears from his decision having been almost invariably confirmed by more recent observations. This revision forms the subject of fifteen memoirs, published between the years 1804 and 1819, and embraces all the families of the apetalous, and monopetalous dicotyledones, as well as the epigynous, and hypogynous polypetales.

Always desirous to complete the view of the vegetable kingdom presented in his *Genera Plantarum*, and to make that work keep pace with new discoveries and the progress of science, Jussieu published successively other memoirs, in which he established new genera, occasioned either by his having become better acquainted with their structure since the publication of his original work, or by the numerous discoveries resulting from recent scientific travels, which had introduced into collections so many forms either wholly new, or associating with genera hitherto insulated, and which he had not therefore ventured to consider as the types of particular families. It was thus that the author of the *Genera*, by being the first to add to the edifice he had himself reared, showed that he considered it susceptible of modifications and improvements; for, like every one of an elevated mind, he was aware that the sciences are never stationary, and admitted that the natural method must become more perfect in proportion as botany becomes more extended.

In this way he added to the families already established in 1789, those of the Loaseæ, the Passifloreæ, the Monimieæ, the Lobeliaceæ, the Polygaleæ, and the Paronychieæ. Finally, many of these memoirs are occupied with the examination of obscure genera, whose relations to known genera, and natural families, could be with difficulty established; of this description are the memoirs on the Phelipæ of Thunberg, the Hydropityon of Gærtner, many genera of the Laurineæ which ought to be united into one, and on different genera of Loureiræ. Perhaps there are few memoirs of great extent which evince more strikingly than these short notices, the extensive knowledge and discrimination of Jussieu: we perceive at every instant how the appreciation of characters, their value, their subordination, or their incongruity, proved a safe guide to him in this difficult investigation. We there see disclosed, so to speak, the method he followed in ascertaining the alliances of numerous exotic genera, often very imperfectly known, and which he has almost always succeeded in classing correctly in his immortal work.

The last memoir published by Jussieu appeared in 1820, in the sixteenth volume of the Memoirs of the Museum. It related to the family of the Rubiaceæ, and presented all the genera arranged and described, after the manner the author intended to follow in a new edition of the *Genera Plantarum*, which he then projected, and for which he had constantly been employed in providing materials. This last work, published when he was seventy-two years of age, is worthy of its predecessor of 1789: we find in it the same arrangement, the same distinctness of ideas, the same simple and precise definitions.

From this period Jussieu's sight became so weak that he was obliged to relinquish the examination of nature, and confine himself to studying the works of others. His only contributions to science are some articles inserted in the Dictionary of Natural Sciences, relating either to the families of plants, or such as are mentioned by travellers under their vulgar names, which he endeavours to refer to their proper genus or family. These consisted of materials collected long before, and we still recognize in them a mind which joined a most extensive erudition to an intimate knowledge of nature.

We ought also to mention the article on the natural method, in the same collection, published in 1824, in which the same skilful hand has given, with his usual perspicuity, the history of the natural method in botany, and explained the principles on which it is founded.

Finally, in the last years of his life, from the date of 1826, his duties relative to the Museum of Natural History having been undertaken by a son worthy of such a father, he passed a great part of the year in the country, and divided his time between the reading of the most modern books on botany, and drawing up an analysis of such of his works as appeared to him of most utility to science.

Combining these recent discoveries with the knowledge he had acquired in the course of his long career, he made them the subject of a new edition of the introduction to his *Genera Plantarum.*

In this *proemium*, which is written in the same pure and elegant Latin as the first Introduction, we find some of the same ideas as he advanced in 1789, particularly those on classification: but it at once appears that he was a stranger to none of the modern discoveries in anatomy and physiology, for he conceived that they all should concur in perfecting the natural method, the base of which should be formed by all the parts of the organization of vegetables. He was engaged almost to the close of his life in completing this work, which turned his attention to his past studies, and agreeably occupied his mind. But his sight had by this time become so weak that it could no longer direct his hand, and he was often obliged to employ the pen of another; but this impediment did not make him discontinue his exertions.

If the labours of M. de Jussieu entitle him to a place in the first rank of sçavans, he may in addition be held up as a model for amenity of character. He was full of kindness to those who devoted themselves to the study of the sciences, and gave every encouragement to such as distinguished themselves in the pursuit. Entirely devoted to the advancement of botany, and searching only for truth, he candidly acknowledged his own errors, and pointed out those of others without asperity. He was never drawn into the polemics of science: no example can be cited, either in his work or in his numerous memoirs, of a single word calculated to injure any of his contemporaries, and yet he was the means of advancing the science much more than those who have combated in support of their views. His were founded on truth, and needed no adventitious support; left to themselves they have gradually wrought their way into science, till they are now generally admitted. He had the happiness, therefore, to join to the distinction he acquired by his scientific superiority, the friendship of all who were able to appreciate him; and the young, to whom he was remarkably kind, entertained a most filial veneration for him. Surrounded by the marks of esteem and friendship, entirely devoted to the study of the sciences, and never extending his ambition beyond this circle; —happy in the bosom of a numerous family, and seeing himself survive, so to speak, in a son worthy to bear his name, and who had become even during his lifetime his colleague and successor,—he passed his long career in the enjoyment of a happiness which he owed as much to himself as to the circumstances in which he happened to be placed; and at last, in the eighty-eighth year of his age, on the 15th September 1836, a short and not very painful disorder brought to an easy termination a life which had been spent in so much usefulness and tranquillity.

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KATER, Captain Henry, F.R.S; an eminent mathematician, was born at Bristol, April 16, 1777. His father was of a German family; his mother the daughter of an eminent architect: both were distinguished for their scientific attainments, and united in inspiring him, from his earliest years, with a taste for physical investigations. After some time his father, who designed Henry for the profession of the law, began to discourage his exclusive devotion to abstract science, and he parted from mathematics as reluctantly as Blackstone from his poetry. During the two years that Mr Kater was in a pleader's office, he acquired a considerable portion of legal knowledge, on which he valued himself through life; but the death of his father, in 1794, permitting him to resume his favourite studies, he bade adieu to the law, and obtained a commission in the 12th regiment of Foot, then stationed in India. During the following year he was engaged in the trigonometrical survey of India, under colonel Lambton, and contributed greatly to the success of that stupendous undertaking. About the same time he constructed a peculiarly sensible hygrometer, and published a description of it in the "Asiatic Researches." His unremitted study during seven years in a hot climate greatly injured his constitution, and was the cause of the ill state of health under which he suffered to the close of his life. After his return to England, he qualified himself to serve on the general staff. He went on half-pay in 1814, from which period his life was wholly devoted to science. His trigonometrical operations, his experiments for determining the length of a pendulum beating seconds, and his labours for constructing standards of weights and measures, are well known; they combine patient industry, minute observation, and mechanical skill, with high powers of reasoning. Most of the learned societies in Great Britain and on the continent testified their sense of the value of capt. Kater's services, by enrolling him amongst their members. The emperor of Russia employed him to construct standards for the weights and measures of his dominions; and was so pleased with the execution of them, that he presented him with the order of St Anne, and a diamond snuff-box. The even tenor of capt. Kater's life was rarely interrupted. The loss of his daughter, who fell a victim to her ardour for science in 1827, was the severest affliction by which he was visited. She died in her seventeenth year, after having displayed mathematical powers of a high order, and a love of science that even increasing physical weakness could not destroy. Most of capt. Kater's publications appeared in the "Philosophical Transactions," to which he was a very constant contributor. He died at his house, York Gate, Regent Park, London, April 26, 1835.

KENDAL, or KIRBY KENDAL (the Church in the vale of Ken), is the largest town in Westmoreland. It is pleasantly situated on the banks of the Ken, or Kent, which flows rapidly through the fertile valleys of a tract of country, that after the conquest was designated the barony of Kendal, and was the reward of Ivo, or John, brother to the earl of Anjou. His lineal descendant, William Steward, of the household of Henry II., assumed the name of Lancaster, perhaps, from the circumstance of being governor of Lancaster castle. From this family the barony descended, through the noble houses of Bruce and Ross, to the Parrs. Sir William Parr, of Kendal, having faithfully served king Edward IV., in his wars with France and Scotland, was created a knight of the garter. Catharine Parr, his grand-daughter, was born here, and became the last queen of Henry VIII.; her brother, Sir William Parr, was by that monarch created first lord Parr of Kendal, and afterwards earl of Essex and K.B. By Edward IV., he was raised to the dignity of marquis of Northampton. The castle, the baronial seat of the above distinguished families, occupies a grassy hill, on the east side of the river; of this structure, four broken towers, and part of the outer walls, only are now remaining. Opposite the castle, and overlooking the town, is Castle-law Hill, an artificial circular mount, about thirty feet high, surrounded at its base by a deep fosse and a high rampart strengthened by two bastions on the east; the summit, which is flat, is crossed by a ditch, and defended by a breast-work of earth. This mount is of greater antiquity than the castle, and as its name imports, was one of the spots on which, in ancient times, justice was dispensed to the people. On this eminence, an obelisk, commemorative of the Revolution of 1688, was erected by the inhabitants of Kendal, in 1788. The church is a spacious gothic structure, with a square tower, containing ten bells; it has three chapels, memorials of the ancient dignity of three neighbouring families, the Bellinghams, Stricklands, and Parrs, and contains many ancient monuments.

In the latter part of the fourteenth century, the manufacture of woollen cloth was introduced at Kendal by emigrants from the Low Countries; and laws were enacted by parliament for the regulation of this branch of industry, in the reigns of Richard II. and Henry IV. The green druggets made in this place, formed, for several centuries, the common wear of the lower classes, and became celebrated under the denomination of 'Kendal green.' Before the introduction of these manufactures, the wool of this country was exported to the Netherlands. At present, the principal articles of manufacture are, cottons, linseys, druggets, coarse woollens, worsted stockings, hats, bonnets, and serges. In the neighbourhood are numerous corn and paper-mills, together with several of various descriptions for the preparation of cloth. Below the town are mills where gunpowder is manufactured. The sawing and polishing of marble—which is brought from the adjacent mountainous neighbourhood—furnishes employment for many of the inhabitants. The manufacture of combs of all descriptions, and spinning of wool, are also among the sources of commercial industry pertaining to this town. The neighbourhood abounds with limestone, of which many of the houses are built. Population of Kendal in 1841, 10,225.

KESWICK; a town in Cumberland, situated in a valley, near the lower end of Derwentwater, 293 miles from London. The parish-church of Crosthwaite stands about three-quarters of a mile northwest of the town, and the lofty mountain of Skiddaw is about three miles distant. The woollen manufacture, and the manufacture of black lead pencils, are the chief occupations of the inhabitants. From the beauty of the surrounding scenery, lauded and patronized by Wordsworth, Southey, Coleridge, De Quincey, and Wilson, Keswick forms a common stage to numberless tourists, and abounds in excellent inns and lodging-houses. Population of the town in 1841, 2442.

KIEFFER, M., professor of Turkish at the college of France, and vice-president of the Asiatic Society, was born at Strasburgh in 1767, where he studied under Oberlin, Schweighäuser, and Dahler. He was at first intended for the church, but the study of the oriental languages, a knowledge of which was required to qualify him for the sacred functions, so captivated him, that he resolved to devote himself wholly to them. A residence of some years at Paris confirmed him in his resolution, and enabled him to carry it into effect. Admitted, in 1794, into the bureau of the ministry for foreign affairs, he was sent, two years after, to Constantinople, as secretary and interpreter to the embassy, of which general Aubert du Bayet was the head. In 1798, when a rupture took place between France and the Porte, M. Kieffer, along with the Chargé des Affaires, was sent to the Castle of the Seven Towers, where his time was devoted to study, and the enjoyment of the society of M. Ruffin, whose instructions, combined with the unwearied perseverance of M. Kieffer himself, enabled the latter to acquire that profound knowledge of the Turkish language, which has since been so honourably displayed in the translation of the New Testament, published at the expense of the London Bible Society. As a proper reward for his services, he was appointed professor of Turkish in the college of France, and in 1815 he received the decoration of the Legion of Honour. But it was not merely as a literary man that M. Kieffer distinguished himself, and we should have a very imperfect idea of his vast and useful activity to view him merely as an orientalist. M. Kieffer found time to engage in many useful associations for the promotion of public morals and education, and to advance the interests of religion, in its tolerant sense. He was appointed chief agent for the London Bible Society in France, and a member of many other religious and philanthropic societies. To diffuse the Holy Scriptures throughout France, and to recommend their perusal, was his chief study. In one year he distributed in this way 160,000 copies of the Bible, which in almost every instance was accompanied with a letter in his own hand; he also corrected the proof sheets of every new edition. His death took place in 1832. Modest and kind in his intercourse with the world, he left behind him the regrets of all good men.

KILDARE; a county of Ireland, in the province of Leinster, comprising, according to the ordnance survey, an area of 392,435 acres, of which 66,447 are unprofitable mountain and bog. The eastern portion of the bog of Allen, including Lullymore, Timahoe, Mouds, and Clane bogs, and covering an area of about 36,480 acres, lies wholly within this county: some of this district may be said to be exhausted for the purposes of fuel, but the residue, which is a complete peat, averages twenty-five feet in depth, and lies for the most part 250 feet above sea-level, having a fall towards the different neighbouring rivers, whereby the drainage and reclamation of the whole appears practicable, and not, comparatively, expensive. The other parts of the county are dry, rich, and productive in corn, which finds a ready and good market in Dublin, being conveyed thither by the royal and grand canals. In the centre of the county is a spacious verdant plain, called *the Curragh of Kildare:* this is now the Newmarket of Ireland, and the soil of this beautiful course, a dry loam reclining upon gravel, affords a turf more elastic and better adapted for running than that of the great race-course of England. Its area is about 5000 acres. The name of Kildare is said to be derived from Chille-dair, a forest of oaks, which occupied this county, and in the centre of which was the Curragh, or plain. On its borders St Bridgid, a vestal virgin, converted to Christianity in the sixth century, is said to have kept watch over the sacred fire, in her cell, the ruins of which are still shown. Few counties in the island are better watered by fine rivers, and none, Dublin excepted, possess the singular advantage of two noble lines of inland navigation communicating with the metropolis. The northern baronies are watered by the Blackwater, the Boyne, and the Liffey rivers; while the Barrow, the Liffey, and the Grees amply supply the southern parts. The grand canal passes directly through the bogs of Allen and Clair, and crosses the river Liffey by an aqueduct; the royal canal passes across the northern baronies into the county of Westmeath. Salmon and trout are taken in all these rivers, and the fishery of the Boyne has always been estimated highly.

Kildare is almost entirely an agricultural county, the produce being disposed of in the metropolis. Vast quantities of turf are also carried, by means of canals, to the Dublin market. Some attempts have been made to establish the cotton manufacture, and large mills were built near Clane, Leixlip, and other places, but they fell into decay. One, however, built more recently at Inchyguire, near Ballytore, is in full operation, and a small woollen manufacture is carried on at Celbridge. The towns in Kildare are unimportant. Besides Kildare itself, to be noticed presently, it contains the incorporated assize and market-towns of Naas and Athy; the market and post-towns of Kilcock, Maynooth, Celbridge, Monastereven, Timoline, Rathangan, Leixlip, Kilcullen-bridge, and Newbridge; also the post-towns of Castledermot, Clane, and Ballytore. The county is partly in the diocese of Dublin, but chiefly in that of Kildare. Population in 1841, 114,488.

KILDARE; a small market-town in the above county, twenty-five miles, W. S. W. from Dublin, on the mail-coach road to Limerick. It was anciently a city and place of importance, and is still the seat of a diocese. The old abbey is much dilapidated. An ancient round tower, 130 feet high, stands in the churchyard. The diocese was founded probably at the close of the fifth century. It extends over most of Kildare, and into the King's and Queen's counties, measuring forty-five miles in length by twenty-nine in breadth. The total number of parishes in the diocese is eighty-five, comprised in forty-one benefices. Population of town of Kildare, 1629; of parish, 2650.

KILKENNY; a county of Ireland, in the western portion of the province of Leinster. It comprises, according to the ordnance survey, 536,686 statute acres, of which 417,117 are cultivated, and 96,569 bog and mountain. It is partly in the dioceses of Cashel and Leighlin, but chiefly in, and comprehending the greater part of the diocese of Ossory, in the province of Dublin. It is divided into the baronies of Gowran, Fassadinan, Galmoy, Crannagh, Shillelogher, Kells, Knoctopher, Iverk, and Ideagh, to which may be added the county of the city of Kilkenny and the liberties of the town of Callar. The principal places within these baronies are, the city of Kilkenny, the corporate towns of Callan, Thomas-town, Gowran, Inistioge, and Knocktopher, which were all boroughs previous to the union with Great Britain, and the non-corporate towns of Graigue, Durrow, Ballygarret, Castlecomer, Freshford, Urlingford, Goresbridge, and Kells. The dense population of this great county are engaged in agriculture, in the collieries, flag, and marble quarries, and in the manufacture of blankets and coarse woollens. Wheat and other sorts of grain are raised in abundance, in all parts of the county, and there are extensive dairy-farms in the district called the Walsh Mountains. The cattle are a mixed breed, consisting of the Irish stock grafted upon the long-horned English. The breed of sheep is also improved by crossing with the Leicestershire. The native horses are lively, active, and hardy, and well adapted to the farmer's use. Few are bred in the county, and the Suffolk sorrel is preferred by any who do attempt to breed. Heifers and bullocks are used in draft by the farmers, in the vicinity of the city of Kilkenny. Traffic is much promoted by the navigation of the Barrow, Suir, and Nore, and is still susceptible of a further improvement.

The calcareous districts of Kilkenny are frequently found to conceal vast excavations, caused either by subsidence, or by the action of subterranean rivers. There are many such in the limestone region of Kilkenny, of which those of Dunmore and Paulstown are the most spacious. The best granite within the county is raised in Mount Loftus quarry; it has a light yellow cast, and is compact and fine-grained. Flag quarries are worked at Conahy, Kellymount, Shankill, &c., and occupy a great number of hands. The flags consist of a siliciferous argillite, and are usually tinged with iron. Limestone is found near the surface in almost every part of the county, and is used both for agricultural and architectural purposes. The Kilkenny marble, as it is generally called, is raised in the black quarry, half a mile from the city of Kilkenny. The stone contains a great variety of impressions of madrepores, bivalves, and turbinate shells, and is worked into beautiful chimney pieces, sepulchral ornaments, &c. The cutting and polishing are effected by means of an ingenious mill. Amongst the minerals of this county the many beds of coal are to be noticed. The coal raised here is of the stone, or non-flaming kind. It burns dully, casting, like charcoal, a steady and strong heat. It is superior to all other fuel for drying malt, and is excellently adapted for the forge or other works where steady heat is required, void of smoke. The chief works, which are called the Lordship Collieries, lie around the town of Castlecomer. At Donane and other places, coals have been raised, but not so extensively as at Castlecomer. There is a spa well at Ballyspellan, in the parish of Fartagh, beneficial in cases of obstruction of the viscera. This fountain is the subject of the witty verses from the pen of Dr Sheridan, the friend of Dean Swift. Chalybeate springs also exist in the city of Kilkenny, at Jerpoint abbey, near Coocullen church, besides several of weak proportion in and near the Castlecomer colleries. Population of the county in 1841 183,349.

KILKENNY; an ancient city of Ireland, and, including Irishtown, a county of itself, and the seat of the diocese of Ossory. It is situated on the Nore, which separates the portions locally known as the Canice or Irishtown, and Kilkenny or Englishtown; the former being on the right, the latter on the left bank of the river. These distinctions, however, are becoming obsolete. Kilkenny is twenty-four miles N.E. by N. from Clonmel, and fifty-seven S.W. from Dublin, on the mail coach road to Cork. It is seen to great advantage from the high eastern bank of the river, with its castle, cathedral, and numerous remains of ancient religious edifices. The streets, however, are very irregular, and the suburbs miserable. The castle belongs to the Ormond family. It was originally built in the twelfth century. The cathedral of St Canice, built in 1202, is one of the finest ecclesiastical edifices in the kingdom. The palace of the bishop of Ossory is connected with it, as also a remarkable round tower. There is a fine promenade, called the Mall, extending nearly a mile along the banks of a canal, and also along the banks of the Nore and the base of the castle. The grammar-school, called the college of Kilkenny, stands opposite to the castle on the other side of the river, and boasts of having educated, among other eminent men, Swift, Congreve, Farquhar, and Bishop Berkeley. Kilkenny formerly carried on a considerable trade in the manufacture of woollen cloths and blankets, which has declined. The chief occupation of the inhabitants is connected with the sale of agricultural produce. Population in 1841, 19,071.

KILLARNEY; a town of Ireland, in the county of Kerry, 167 miles S.W. from Dublin, on the present mail-coach road to Cork, from which city, it is distant forty-five miles. It consists of two main streets, off which branch several lanes and alleys. There is little business carried on in the town beyond the retail trade. A variety of ornamental articles are made from the arbutus tree, and sold to strangers visiting the lakes. During the autumn and summer months, the place presents an animated appearance from the influx of strangers. The mansion of lord Kenmare, with its parks and grounds, adjoins the town. Population in 1841, 7127; of parish of Killarney, 10,476.

The *Lakes of Killarney*, so celebrated for their romantic scenery, are situated about a mile and a half from the town, on the confines of a chain of lofty mountains. The space included between this chain and the ocean on the west, containing upwards of thirty square miles, is entirely occupied by other mountains of still greater magnitude, amongst which are those called Macgillicuddy's Reeks, the most elevated in Ireland. In general, the disposition of these mountains is very irregular; but as they approach the sea, they form short ridges, terminating on the coast in bold and rugged headlands. This mountainous region abounds with lakes. They are mostly found in the depths of the valleys, but some are situated in the sides of the mountains, at a great elevation, in cavities, resembling the craters of volcanoes. In the vicinity of Killarney, on the summit of the mountain called Mangerton, there is one of these lakes many hundred feet above the level of the sea, the natives style it the Pit of Hell, but it is familiarly known by the name of the Devil's Punch-Bowl. After heavy rains, it discharges a large stream, which precipitates itself down the mountain in a succession of cataracts, distinguishable by their white foam at the distance of many miles. Of all the lakes of Kerry, however, the largest and the most remarkable are those of Killarney. They may be considered, indeed, as Mr Weld observes, as an immense reservoir for the waters of the surrounding country, supplied by the overflowings of other lakes, by rills from the adjoining mountains, and by rivers which fall into them, after having been augmented during a long course by countless tributary streams. The only outlet to this extensive basin is the clear and rapid river Laune, which conveys the surplus water into the Atlantic ocean, through the bay of Dingle.

The Lakes of Killarney are three in number, —that is to say, there are three distinct bodies of water; each of them, however, communicates with the other two. We have said that these lakes are upon the confines of a range of mountains. One of them is, indeed, on the mountains—completely embosomed within lofty heights; the others lie at the foot of the mountains. These two lower lakes are bounded on one side only by mountains; in the opposite direction they are open to a cultivated country, whose surface is diversified by innumerable hills. They are nearly upon the same level, and lie contiguous to each other, being separated merely by a narrow peninsula and some small islands, between which there are channels passable for boats. The Upper Lake lies on the mountains above, at the distance of three miles from the Lower Lakes; a navigable stream, however, descends from it, and communicates with each of them, by dividing into two branches. This lake on the mountains is called, from its situation, the "Upper Lake;" of the others below, the larger one is called the "Lower Lake," and the smaller, "Turk Lake," from an adjacent mountain bearing the name of "Turk."

The *Upper Lake* is about two miles and a half in length, and, from its numerous indentations, of very irregular breadth. It is thickly studded with islands, and surrounded with mountains.

The *Lower Lake* is five miles and a quarter long, its greater breadth is two miles and a half, and its mean breadth one mile and a half. The water of the lake is in many parts very deep, and tolerably clear. Smith says that "the common people hereabouts have a strange romantic notion of their seeing, in fair weather, what they call a carbuncle at the bottom of this lake, in a particular part of it, which they say is more than sixty fathoms deep." This is not, however, the only "romantic notion" entertained by the common people concerning Lough Lein, as the lake was anciently called. The "Legend of O Donoghue and his White Horse" surpasses it vastly, in point of interest and extravagance, as indeed it surpasses most of the legends current in that stronghold of tradition, the south of Ireland.

Ross Island is the largest of those contained in the Lower Lake. It is sometimes called a peninsula, for its separation from the main land is but partial. A morass occupies the intervening space, and is reduced to a narrow isthmus by inlets on each side. A small canal through this isthmus, just admitting the passage of a single boat, is the only separation between the island and the main land during the summer, and even this sometimes disappears. In winter the whole isthmus is overflowed, and Ross becomes then perfectly insulated. The shape of this island is very irregular. It stretches out for some distance from the eastern shore towards the middle of the lake, and then throws forward a projection to the northward. Thus there is formed between the island and the main land a bay, the head of which is bounded by the isthmus connecting them, and the mouth of which opens to the northward; this is called Ross Bay. The common place of embarkation for strangers at Killarney is at the head of Ross Bay, at a quay under the walls of the castle; this being the nearest part of the lake to which there is a communication from the town by a carriage-road. From the town Ross castle is about a mile and a half distant. Ross castle is said to have been built by a powerful sept, or tribe, of O'Donoghoes; the name of O'Donoghoe-Ross was given to this family to distinguish it from that of O'Donoghoe-More. It was a place of strength in the time of Cromwell, and is celebrated for the obstinate resistance which it made to the attacks of the parliamentary army under general Ludlow, in the year 1652.

Next to Ross Island in size, is that of *Innisfallen*, the most beautiful, fertile, and interesting of all in the lower lake. It is in extent about eighteen acres, and contains a small banquetting house, and the ruins of an abbey founded in 600.

Turk Lake is about two miles in length, and one in breadth. The island of *Dinis* on this lake is richly wooded, and contains a cottage for the refreshment of visitors. The peninsula of Muckross forms the northern boundary of the lake.

KILMALLOCK; an ancient town in Ireland, situated sixteen miles from Limerick, on the road leading to Cork. It is principally remarkable for the extraordinary contrast between its former greatness and its present fallen condition; on account of which it has been styled the "Balbeck of Ireland." Archdale, speaking of it, says, "Kilmallock was formerly a town of great note, being walled, and the houses beautifully and elegantly built of hewn stone; it is now in ruins, yet has a greater share of magnificence even in that miserable state than any town in Ireland." Sir Richard Colt Hoare, thus describes its general appearance: "The first view of this place is singularly striking, it has the appearance of a town suddenly deserted and left in ruins. I entered it by the side of a lofty turretted gateway, leading into the principal street, which is formed on each side by a line of houses, excellently well built of stone; a certain uniformity prevails in the style of architecture, and in a great measure ascertains their date. Many of these houses have been perfectly gutted, and have only the outward shell of wall remaining. This town was fortified with a strong wall, and (as I was informed,) had five gates, of which two only now remain; the one on the road to Limerick, called St John's Gate, the other leading towards Charleville." According to others there were originally but four gateways; the two which remain are built in a massive style, and have a solid heavy effect, "with a strong resemblance to Spanish or Moorish architecture." The Limerick gate looks towards the north: and the Charleville gate towards the west. A portion of the town-wall, still retaining in some places its original height, may be traced uninterruptedly from the one gate to the other; it is supposed to form a fourth part of the whole rampart. It is the main street, however, which conveys the best idea of the ancient consequence of Kilmallock, and likewise, it may be added, of its present degradation. On each side are the remains of houses built of hewn stone, and apparently on an uniform plan; the workmanship is so excellent, that the walls of many of them are still in perfect preservation, only roofs and floors being wanted to make these as complete as when formerly inhabited. Population of the town, 1408; of parish, including town, 3126.

KILRUSH; a thriving little sea-port of Ireland, in the county of Clare, twenty-one miles S. W. from Ennis, and 130 from Dublin. It is situated about fifteen miles from the mouth of the Shannon, near the head of a small creek or inlet, which forms a good bay for vessels. The trade of the place consists in the export of corn and butter, and occasionally flags and slates. The vicinity is rich in natural productions, besides slates and flags, limestone, gritstone, coal, manganese, and potters' clay are found here. The cliffs along the shore produce samphire and mushrooms, and the strands afford dilisk and leaver, from the latter of which slake is made. In the town friezes, flannels, and coarse linens are manufactured. Population of town in 1841, 5071; of parish, 11,385. Besides this *Kilrush*, there are five other parishes bearing the same name, in Ireland, namely, one in Kildare, with 577 inhabitants; one in Kilkenny, with 754 inhabitants; one in Waterford, with 723 inhabitants; one in Wexford, with 3158 inhabitants; and one in county Dublin, the inhabitants of which are not separately enumerated.

KINCARDINE signifies in Gælic, the *clan of friends;* and the name is applied to several parishes and towns throughout Scotland, besides to the county noticed below. There is a parish and village of *Kincardine* in the counties of Ross and Cromarty, with a population in 1841, of 2,008;—there is a parish of *Kincardine* in the southern part of Perthshire, district of Menteith, with a population of 2232; there is a parish of *Kincardine* in Inverness-shire, incorporated with Abernethy;—there is a parish called *Kincardine O'Neil* in Aberdeenshire, with a population of 1857;—there is a *district* in Aberdeenshire with the same name, which embraces a population of 14,987;—and finally, there is a considerable thriving sea-port town called *Kincardine* in the parish of Tulliallan, situated on the shore of the Frith of Forth, at the distance of five miles east from Alloa, with a population, including the parish, of 2875.

KINCARDINESHIRE; a county of Scotland, extending along the coast of the North Sea about thirty-two miles, and containing, by accurate measurement, 243,444 English acres. It is bounded on the north by Aberdeenshire, and on the southwest by Forfarshire, the sea forming its other boundaries. It was anciently and is still popularly called *the Mearns*, from its having, according to tradition, become the property of Mernia, a brother of king Kenneth II.: another brother, called Angus, conferring his name upon the adjoining county of Forfar. The more modern appellation of the shire is derived from the village of Kincardine, formerly its chief town; but from which the courts of judicature were removed in the reign of James VI., to Stonehaven, where they are still held, Kincardine having now dwindled into a mere hamlet or farm-steading. The surface of the county bordering on the sea, is partly rugged, and partly flat, with a gradual rise from the coast to a fine level elevation of about 150 feet, intersected by a range of the Grampian Hills, forming the north side of the How, or Hollow of the Mearns, which is the north-eastern extremity of the vale of Strathmore. South of this tract the soil is fertile, and recent improvements in agriculture have made it exceedingly productive; but the north-west district being mountainous, is only appropriated to pasturage. It is watered by numerous streams, of which the rivers Bervie, Carron, Cowie, and North Esk, are the chief, and contains, besides the county town of Stonehaven and the royal burgh of Inverbervie, five or six small towns, as Johnshaven, Lawrencekirk, Fettercairn, Fordoun, and Auchinblae, with several elegant mansions of the Scottish gentry, and various remains of Roman and other ancient places of strength, such as the Green Castle, Dunnottar Castle, Fenella's Castle, the Kame of Mathers, &c. There is no coal or marl in the county, and very little limestone, but the latter is imported in large quantities for agricultural purposes. Population of Kincardineshire in 1821, 29,118; in 1831, 31,431; and in 1841,33,075.

KINGSTON; a town of Ireland, situated on the southern shore of the bay of Dublin, five miles E.S.E. from that city. It was formerly called Dunleary, but received its present appellation in honour of George IV. embarking for England at this port, after his visit to Ireland in 1821; in commemoration of which a small obelisk stands near the harbour. The harbour, the largest yet formed in Ireland, was commenced in 1816, and from that period the prosperity of the place may be dated. From a small fishing village, it has risen rapidly to an elegant metropolitan suburban town, containing ranges of handsome buildings, inhabited chiefly by opulent citizens of Dublin. Intercourse with the metropolis is greatly facilitated by the Dublin and Kingston railway, which was opened to the public on the 17th Dec. 1834. Population of Kingston by last census, 7229.

KINROSS-SHIRE; one of the smallest counties of Scotland, bounded on the north by Perthshire; on the west by Clackmannan; and on the east and south by the shire of Fife, from which latter county it was disjoined in the year 1426. It extends from east to west about eleven miles, and from north to south nearly ten. This district exhibits a beautifully diversified surface, and includes the fine sheet of water termed Loch Leven, whose romantic banks are adorned with several elegant mansions. From the north side of this expanse the country gradually assumes a gentle acclivity; while on the opposite side the ground rises precipitately, and has a much more rugged appearance. Agriculture is the chief employment of the inhabitants, the county being much divided into small farms, each owned in feu by its tenant at a trifling quit rent. The higher parts of the county are chiefly composed of whinstone, between the layers of which lead-ore is frequently found; limestone, ironstone, and coal, are also met with in great plenty. The only town in the shire is Kinross, noticed below, and the next place in importance is the populous village of Milnathort, commonly called the Mills of Forth, in both of which the manufacture of linen and cotton are carried on to some extent. The county is joined with that of Clackmannan under one sheriff-depute, but there is a resident sheriff-substitute at Kinross. Population in 1821, 7762; in 1831, 9072; in 1841, 8763.

Kinross, the capital of the above county, is situated on the north-western shore of Loch Leven; distant from Edinburgh twenty-seven miles; from Perth, seventeen. It is a place of considerable antiquity, and was originally dignified by a castle, situated on a promontory jutting into the lake, and of which the town was a dependence. This stronghold was long the residence of the earls of Morton, but it was removed, and an elegant structure built in its stead in 1685, by Sir William Bruce of Kinross, the celebrated architect. The town itself has recently been much improved by the erection of many good buildings. The chief occupation of the inhabitants is the weaving of linen and cotton goods. Population of town and parish of Kinross in 1821, 2563; in 1841, 2822.

KINSALE; an ancient sea-port of Ireland, fourteen miles S. from Cork, and 140 S.W. from Dublin. It is situated near the mouth of the river Bandon, on the acclivity of an eminence called Compass Hill. The streets run round the hill, one above another, and are connected by steep and narrow lanes, unsafe for carriages. Here, however, are many good private residences, an extensive barrack, a market-house, prison, an ancient church, Roman Catholic chapels, &c. This was a place of great importance at an early period; and it is to the excellence of its harbour that its origin and greatness are attributable. It appears to have been enclosed with walls, and regularly fortified. Edward III. granted a charter of incorporation to this place, and Edward IV. renewed and confirmed the grant. Owing to a successful landing effected here by the Spaniards, in 1600, the charter was forfeited, and the Spaniards were expelled by lord deputy Mountjoy, who compelled the commander, Don John de Aquilla, and 5000 Spaniards, to a surrender. The charter, however, was restored in the succeeding reign; and in the year 1649 the town was invested by Cromwell, who received the keys from the mayor, and delivered them to colonel Stubleen, the governor. In the reign of Charles II. a regular fort was begun here by lord Orrery, to which, upon its completion, the duke of Ormond gave the name of Charles Fort. It is a strong fortress, commanding the harbour in so entire a manner, that all vessels must pass within pistol shot of it. James II. granted a new charter to the inhabitants, and in the year 1688 landed at this port from France. In 1690 the earl of Marlborough took the old fort, and compelled the town to surrender.

The harbour of Kinsale is of a circular form, perfectly land-locked by high grounds, which enclose it on every side, and is watered by a long deep narrow channel, guarded by a fort, at which there is a lighthouse exhibiting a small bright light, while the sea entrance is shown at night by a fixed bright light upon the old head of Kinsale. Here was formerly a royal dock-yard and store-house, but the naval dépôt has been transferred to Cork, so that Kinsale derives little advantages of trade from its safe, sheltered, and secure harbour. Coal is imported, and the coasting-trade gives employment to many, but the great marine establishment of Kinsale is its fishery. Upwards of 400 vessels of about twenty tons burden, and known by the name of hookers, are constantly employed in this business, and afford an ample supply of fish to the markets of Kinsale, Cork, and Bandon. They are admirable sea-boats, put to sea in all weathers, and are eminently serviceable in the way of pilotage. Kinsale fishermen and pilots are exempt from impress. As a further compensation for the loss of trade, Kinsale has become a fashionable bathing-place. Population in 1841, 6988.

KIRKALDY; a town in Fifeshire, Scotland, situated near the northern shore of the Frith of Forth, about twelve miles from Edinburgh. It is said to have been anciently the seat of a society of Culdees, whence it was called Kill-Celedes, a name changed during the Scoto-Saxon period to Kirk-Caledie. Although, however, allowed to be of high antiquity, no record of it exists of earlier date than 1334, when it belonged to the abbots of Dunfermline, as a burgh of regality, and so continued till it passed in 1450, to the bailies and their successors for ever. Shortly after this it was erected into a royal burgh by charter, which Charles I. confirmed in 1644, and made it a free port, with further privileges, and a jurisdiction, extending on the northern coast of the Forth, from Aberdour to Largo, inclusive. At that period it is stated to have been more populous than now, and to have had at least 100 ships.

Kirkaldy in the present day consists chiefly of a very long street, well paved and lighted, in which are many elegant shops and houses; also several cross streets, and a variety of detached edifices, the residences of the wealthier inhabitants.

The trade of the place bears an intimate resemblance to that of Dundee, consisting almost exclusively in the spinning of flax, and the weaving of coarse linen goods for home and foreign consumption. The town possesses ten distinct establishments for the spinning and preparation of flax, in all of which steam-power is employed. There is one large establishment for weaving, in which steam is also the agent of movement. The rest of the flax prepared here is woven by the hand, and engages a great number of individuals. The fabrics prepared and woven, are chiefly ticks, dowlas, checks, and sail-cloth. There are four bleachfields connected with the town for the whitening of the yarns. Kirkaldy has likewise a rope-work. In the town and environs, there are two breweries and a distillery, likewise two iron foundries, where the machinery employed in the spinning-mills is manufactured. Salt was once made to a considerable extent, but it is now manufactured on a very small scale. Besides these chief public works, there are many minor establishments incidental to a populous sea-port town. The harbour of Kirkaldy is situated at the east end of the town, and though of large dimensions, with a good stone pier at the east and west sides, it has the misfortune of being dry at low water; and at such times of the tide the passengers of steam-vessels have to embark by means of small boats. The shipping belonging to the town in 1836, consisted of seven vessels connected with the whale fishery, eighteen in the foreign and general trade of the country, two smacks engaged in the London trade, two vessels in the trade to Newcastle, two in the Glasgow trade by the canal, two in the trade to Leith, and one in the Dundee trade: burden in whole 6709 tons. The custom-house of Kirkaldy includes all the ports from Aberdour to St Andrews. The town possesses several branch banks, a chamber of commerce, a subscription library, a mechanic's library, and two newsrooms. The celebrated Dr Adam Smith was a native of Kirkaldy. The house in which he was born was taken down and rebuilt in 1835. Population of burgh and parish in 1841, 5275. To the west of the royalty, but within its boundary, as fixed by the act 2 and 3 William IV., are the populous village of *Linktown*, in the parish of Abbotshill, and the village of *Westbridge* in the parish of Kinghorn.

KIRKCUDBRIGHT; a county of Scotland, or, as it is more commonly called, a *stewartry*, from its having at one time been crown property, and under the authority of a royal *stewart*, is bounded on the south by the Solway Frith, on the north by Ayrshire, on the east by Dumfries-shire, and on the west by Wigtonshire. It extends from south-east to north-west forty-four miles, and its breadth ranges from twenty-one to thirty-one miles. It embraces a superficies of 855 square miles, or 547,200 statute acres. It is one of the two counties comprehended under the general name of *Galloway*, Wigtonshire being the other. The general appearance of Kirkcudbright is mountainous, and the high lands are mostly covered with heath, producing little else than pasturage for cattle and sheep, which are here bred for distant markets, the English in particular, and exported in great numbers, together with horses of the noted Galloway breed. A regular and cheap communication with Whitehaven and Liverpool, by means of steam navigation, affords to agriculturists a convenient outlet for the disposal of their produce. The soil in the lower grounds is, in many instances, possessed of great natural fertility, and affords plentiful crops. The climate is moist but warm, and in genial seasons figs ripen on the open garden-walls. The rocks of the county are argillaceous, granite, or whinstone with some freestone. Some mineral veins of lead, copper, and iron have been found. Coal is extremely scarce, which, along with lime, is brought from Cumberland. The district possesses a variety of lakes, but few of them are considerable. The principal rivers are the Nith, which separates the county from Dumfries-shire, the Dee, the Ken, the Cree, and the Urr; and the smaller streams are the Fleet, the Tarf, the Deugh, and the Cluden. The Solway Frith, in a circular form, washes the coast of the stewartry from the Nith to the Cree, a space of forty-five miles, and along the shore, the coast is bold and rocky, the cliffs sometimes rising to a great height. A range of mountains stretches along the whole northern boundary, and there are also considerable mountains on the southern extremity, such as, Cairnsmore, 2597 feet in height, Criffel, 1831 feet, and Cairnbarrow, 1110 feet. The land is almost universally enclosed, chiefly with stone walls, called Galloway Dykes. The enclosing of the land with fences was begun in the year 1724, and the measure was at first looked on with hostility by the country people, who rose to the number of 500, and, under the name of Levellers, proceeded to demolish the fences which had been erected. The insurrection, which originated from some peculiar notions as to the general rights of property, was suppressed by six troops of dragoons. After this, the country advanced in improvement, and when shell marl was first applied as manure in 1740, a great stride was made towards a better condition. The land was now cultivated on a great scale, and after the year 1760, considerable exportations began to be made. The important changes which ensued have, with justice, been traced in a great degree to William Craik of Arbigland, who introduced new rotations of cropping, new methods of cultivation, new machinery, and new modes of treating cattle. Since 1790 the district has coped with Dumfries-shire and other counties adjacent, in its agricultural improvements, and in the beginning of the present century, colonel M'Dowal of Logan, accomplished much in reclaiming moss-lands. Much has been effected by judicious planting by several noblemen and gentlemen of the stewartry. In 1814 it possessed 6000 horses, 50,000 cattle, and 178,000 sheep, besides swine to a prodigious extent; these animals being now a staple commodity in the usual produce, both for home consumpt and exportation. The real rental of the stewartry in 1811 was £83,487 for lands, and £3549 for houses. The manufacture of linen, woollen, and cotton goods engages a number of hands in the towns and the villages. A granite quarry, which employs 300 workmen, was opened in this county in 1830 by the Liverpool dock company. The stewartry contains two royal burghs—Kirkcudbright and New Galloway; and several considerable villages, as Maxwelltown, Castle Douglas, Gatehouse-of-Fleet, Creetown, &c. most of which have been built within the last eighty years. It includes twenty-eight parishes. Population in 1821, males 18,506, females 20,397; total 38,903; in 1841, males 18,856; females 22,263; total 41,119.

KIRKCUDBRIGHT; the capital town of the above county, is beautifully situated on the left bank of the Dee, about six miles from its entrance into the Solway; distant from Edinburgh one hundred miles; from Dumfries, twenty-eight. It is supposed to owe its origin and name to St Cuthbert, whose church was erected here as early as the eighth century. The church, some time between 1161 and 1174, was granted by Uchtred the son of Fergus, the lord of Galloway, to the monks of Holyrood, who retained it till the Reformation, and by the general annexation act it was afterwards vested in the crown. There was also in Kirkcudbright a church dedicated to St Andrew, which, after the Reformation, was conferred on the burgh; and it appears that there was likewise a Franciscan monastery, of which the records are altogether silent. The establishment of St Cuthbert's church was preceded or followed by the erection of a small fort by the lords of Galloway, which became in later times a castle in the proprietary of the crown, and caused the place to be put under the government of a constable. During the domination of the Douglasses in Galloway, Kirkcudbright became a burgh of regality under their influence; and on their forfeiture, James II. erected the town into a royal burgh, by a charter dated at Perth, the 26th of October, 1455. Hector Boece, referring to it soon after this period, calls it "ane rich town full of merchandise," a character it most likely deserved till injured by the troubles in the country. The appearance of the town at the present day is extremely pleasing, being regularly built, neat, and clean, and at a distance it seems embosomed in the foliage of a fine sylvan country. No town in Scotland possesses such a proportion of new houses; the cause of which is to be found in an arrangement among the inhabitants, by which a certain number of houses are built by subscription every year, and acquired by lot. In addition to the modern appearance which the town has acquired in this way, it is ornamented by the residences of many persons of good fortune, which, instead of being scattered in the suburbs of the town, as elsewhere, are placed in the streets, and that in considerable numbers. The town now possesses little or no trade, and has no manufactures, except hosiery on a small scale and the weaving of cotton. The harbour is the best in the county; at ordinary spring tides the depth of the water is thirty feet, and at the lowest neap tides, eighteen. Population of burgh and parish in 1841, 3525.

The distinguishing ornament of Kirkcudbright is *St Mary's Isle*, the seat of the earl of Selkirk, which lies about a mile south from the town farther down the Dee. Originally an island between the waters of this river and the swelling tide, it is now a peninsula projecting into the bay, luxuriantly wooded with oak, chestnut, walnut, and all the finer species of forest trees; and is, beyond all question, one of the loveliest spots in Scotland. The house was originally a priory, which was founded either in the reign of David I. or his successor Malcolm IV., in the twelfth century, by Fergus, lord of Galloway, and called "Prioratus Sanctæ Mariæ de Trayll." The monks were canons regular of the order of St Augustine. St Mary's Isle was visited in 1778 by the celebrated Paul Jones, when in command of an American ship, with the view of carrying off the earl of Selkirk as a hostage. The earl was absent, but the crew took away the silver plate, which, however, was afterwards returned by Paul Jones himself, who purchased it from his men at his own expense for that purpose.

KIRKDALE; a parish and village in the north riding of the county of York, about twenty-five miles N.N.E. of the city of York. Population in 1841, 1040.

In the summer of 1821, a cavern was accidentally discovered in this parish by some quarriers, which has greatly attracted the attention of geologists and men of science from the number and character of fossil bones found therein. The cave is situated in the side of a ravine, and its entrance is an aperture less than five feet square, which a person enters upon his hands and knees. The greatest length to which the cave penetrates, is from one hundred and fifty to two hundred feet, and the interior is of very irregular breadth and height, varying from two to seven feet, but seldom exceeding the latter dimensions either way. The roof is studded with pendant stalactite, or that deposit which is made by water filtrating through limestone, and which, when laid on the floor of a cave, is called stalagmite. A coating of this stalagmite covers the bottom of the Kirkdale cave; beneath this is a layer of soft mud, about a foot in depth; and below this again, is a second coat of stalagmite, spread over the proper floor of the cavity. Deprived of these coatings, the cave, it is obvious, would be considerably more roomy. In the lower part of the mud coating, and in the inferior layer of stalagmite, were the animal remains of the cave chiefly found. These consisted of the bones of no less than twenty-three species of animals; namely, hyæna, tiger, bear, wolf, fox, weasel, elephant, rhinoceros, hippopotamus, horse, ox, three species of deer, hare, rabbit, water-rat, mouse, pigeon, raven, lark, a species of duck and partridge. The bones, in all these cases, were broken into angular fragments or chips, and were all more or less decayed, though the gelatinous matter yet remained in some of them.

On these bones being discovered, the question naturally suggested itself, How came they to be accumulated into a cave, evidently of no great age, geologically speaking—into one spot—in this manner? One mode of answering this query is, to suppose that the animals may have retired there spontaneously to die. Another solution of the point is, that their carcases may either have been drifted into it entire by the waters of a flood, or the bones alone washed in, after their separation from the flesh. Against both these explanations, insuperable objections may be brought. The cave could not have admitted the entire bodies of the elephant or rhinoceros, living or dead; had the bones been drifted in singly, they would have been smoothed more or less by rolling, and would have been mixed with gravel and rolled pebbles. Neither of these explanations, besides, accounts for the broken and splintered state of the bones, or for the great numbers of teeth in comparison with other bones. Many other objections might be adduced, but these are sufficient to show the inefficacy of the theories mentioned to explain the accumulation of these bones in the Kirkdale cave.

The explanation which professor Buckland adopted, has every appearance of being correct. He regards the cave as having been, during a long succession of years, *inhabited as a den by hyænas*, who had dragged into its recesses the other animal bodies, whose remains are found mixed with their own. The number of facts brought forward in support of this explanation by professor Buckland, is very great. In the first place, the habits of living hyænas have been referred to, and it has been found that these animals are in the habit of dragging carcases towards their dens—even those of camels and other large creatures—and this from very considerable distances. It has been doubted, indeed, whether hyænas actually munch the bones of their prey in their dens, but recent observations go to substantiate the truth of this. Again, the mode in which hyænas deal with bones given to them as food, has been examined, and the result is entirely confirmatory of Buckland's supposition. We give the account of this examination in his own words: "I have had an opportunity of seeing a Cape hyæna at Oxford, and of observing the animal's mode of proceeding in the destruction of bones; the shin-bone of an ox being presented to him, he began to bite off, with his molar teeth, large fragments from its upper extremity, and swallowed them whole, as fast as they were broken off." A part only of the bone, of harder texture, was left by the hyæna, and "the state and form of this residuary fragment are precisely like those of similar bones at Kirkdale." On some of the Kirkdale bones are marks of teeth, which marks fit exactly the teeth of the hyæna's jaws found in a cavern; a very strong corroboration certainly of Buckland's opinion. Now, the marks of teeth, on the bones munched by the living hyæna, "entirely resemble the impressions we find on the bones at Kirkdale; the small splinters, also, of the freshly gnawed bone, in form, and size, and manner of fracture, are not distinguished from the fossil ones." But the strongest fact yet remains. In the mud and stalagmite of the Kirkdale cave, were found considerable quantities of what appeared to be the refuse of animals that live much on bones, and which is known by the name of *Album Græcum.* On the day following that on which professor Buckland fed the living hyæna with bones, "the keeper (says he) presented me with a large quantity of Album Græcum, disposed in balls, that agree entirely in size, shape, and substance, with those found in the den at Kirkdale." We will add to these only one other confirmatory circumstance. On some parts of many of the fossil bones, there appeared a smoothness and polish, which could not result from the action of moving water, as other portions of the same bones were splintery and angular. Water would have rounded the whole equally. Professor Buckland therefore concludes, with probability, that the partial smoothness in question must have been produced by the repeated touch of the living hyænas' feet and skin, in their movements to and fro in the cave.

The extreme voracity of the hyæna accounts sufficiently for the number and variety of the animals found in its den. It is quite consistent with our knowledge of the creature's habits that it should have preyed on rats and mice, in the occasional absence of larger victims. Hyæna bones are found in the cave in the same fractured state as those of other animals; but this is a circumstance of no moment, as at this day hyænas prey on the young and helpless of their own kind, when pressed by hunger. It might be expected, to complete the chain of proof, that hyæna skeletons should have been found in some instances entire. Though this was not the case as far as the Kirkdale cave was concerned, the greater part of the bones of a complete hyæna were actually discovered in another bone-filled cave of the same kind.

All the change that has taken place on the cave since the hyænas inhabited it, is the formation of a layer of mud of about a foot deep. This professor Buckland is now inclined to ascribe to the last of the many geological revolutions that have been produced by violent irruptions of water, and to which last irruption the present diluvial matter of the earth's surface owes the disposition it bears.

The wide extent of the geological revolution in question, as well as all the other conclusions drawn from the phenomena of the Kirkdale cave, have received the amplest confirmation from the discovery of various caves of the same kind in Britain, and also in Germany, where bears for the most part seem to have been the tenants of the excavations. The great cavern of Gailenreath, in Franconia, which seems to have been the residence of white bears of an extinct species, contained cart-loads of bones of nearly the same animals as those on which the hyæna preyed. In every respect the position of the fossils corresponded with those of Kirkdale.

It thus is rendered almost certain, that there was a time when climes now cold must have once enjoyed a higher temperature, since our wilds and forests teemed once with animals now only found in hotter and southern latitudes,—that many generations of these lived and died, and were the prey or the tyrants of others;—that the hyæna, according to the instincts which still actuate it, dragged the bodies of those it killed or found slain, into its den, and there devoured them at its leisure; and that, finally, some great catastrophe brought destruction to the whole race, involving the remains of the dead in one mass; since which the temperature of this country has changed, and the wild animals of southern latitudes are now here extinct.

KIRKSTALL ABBEY. Kirkstall is a village situated on the river Aire, three miles from Leeds, in the West Riding of Yorkshire: the ruins of the abbey occupy a considerable space, measuring from north to south three hundred and forty feet, and from east to west four hundred and forty-five feet. It is probable that the vicinity was of considerable importance even in remote antiquity, being the site of a considerable Roman station, as Roman coins have frequently been dug up at Cockbridge, a village two miles north of Kirkstall abbey; and on an adjacent moor, traces of a Roman town have been discovered, consisting of fragments of urns and other pottery, with the ruins of a large stone aqueduct; and also the remains of a camp may be observed, admeasuring about five chains by four, with a single vallum. The choir of Kirkstall abbey extends fifteen yards by eight and a half, and has three chapels on each side: the transept is a square of nine yards and a half each way. The nave is forty-eight yards long, by eight and a half wide. Kirkstall abbey was founded in 1152 for Cistercians; they were first settled at Bernoldswick, near Gisburne, in Craven. The revenues of the house at the dissolution of the monasteries were estimated at three hundred and twenty-nine pounds per annum—a very large sum in those days: the site of the abbey was at that period granted to archbishop Cranmer and his heir. Among the monastic remains of the north of England, this ruin may justly claim an elevated rank: for, as a picturesque feature in landscape scenery, it is inferior only to Bolton abbey, and as a specimen of architecture, it need hardly yield the palm of superiority to any other northern ancient edifice, the celebrated Fountain's abbey only excepted. Nearly the whole building yet remains, as only the lead and timber were removed at the dissolution. The whole exhibits that struggle between the Norman and early Gothic styles, which marks the buildings of the reign of Stephen.

KLIPSPRINGER. This animal is one of the many species of the antelope; it inhabits the southern regions of Africa, among the most inaccessible and barren mountains of the Cape; the native Hottentots call this animal the Kainsi. Its length, from the tip of the muzzle to the end of the tail, is three feet two inches; its height at the shoulders is twenty-one inches, but at the croup, about twenty-two; the horns of this animal are three inches and a half long; the ears four and a quarter, and the tail three. The head of the klipspringer is small and short, terminating in a small round black muzzle, void of hair; the sides of the head are somewhat compressed, and contracted rather suddenly in front of the orbits; the ears are large, open, and at the points a little rounded; and the eyes are particularly dark, and rather large. The horns of the male are quite straight, and have three or four small annuli, or rings, round their roots; elsewhere they are perfectly smooth. The knees are, in appearance, a hard patch, which is caused by their frequent rubbing against the rocks; while the tail is but a short brush of hair. The colour of the animal is generally of a mixture of yellow and green, but the under parts of the body are a light sandy red, tinged with yellow; and the inside of the ears is clothed with long white hair, surrounded at the edges with a narrow black border. In this species of antelope, the legs are much stronger than in most others, and the hoofs much rounder, not pointed and flat, as in many others; and the tips of them are worn much more than any other part, from the animal treading on them alone; which together with the straightness of the pastern joint, in a great measure accounts for the astonishing agility with which the klipspringer bounds from the high and dangerous rocks and precipices which abound in that country. From the great value set upon its hair for stuffing mattresses, saddles, &c., and for its flesh, which is excellent venison, immense numbers fall a prey to the avarice of the natives; and in addition to these, a great many of the young ones are destroyed by eagles, and other birds of prey inhabiting that climate; so that the animal is become less common than formerly, and grows every day much scarcer.

KNARESBOROUGH; an ancient town in Yorkshire, eighteen miles west of York, situated on a cliff above the river Nidd, a stream of minor importance generally, but which, in its short course from the high moorlands till it joins the Ouse, flows through some delightful scenery. On one side of the river (the side on which the town lies) are the ruins of Knaresborough Castle; opposite is the famous Dropping-Well, and in the cliffs, or steep banks, are caves or excavations made in ancient or modern times, but alike in the circumstance of having been formed by persevering but misapplied industry. One excavation bears the name of St. Robert's Cave (St. Robert was a famous ascetic of the thirteenth century, whose chapel and hermitage are also shown here), but which is rendered more remarkable as having been the scene of the murder committed by the schoolmaster, Eugene Aram. Other excavations were formed by an industrious weaver and his son, who also cut the cliff into terraces, rising one above another, and planted them with flowering shrubs and evergreens. The cliffs on both sides of the Nidd, near Knaresborough, are said by professor Sedgwick to exhibit some fine modifications of the magnesian limestone.

The *Castle of Knaresborough*, occupied a most elevated situation, and, on the accessible side, was defended by a vast fosse, with strong works on the outside; the scattered ruins which still remain show it to have been a fortress of great extent. This castle was founded by Serlo de Burgh, who came into England with the Conqueror, and he was succeeded in his possession by Eustace Fitz-John, the great favourite of Henry I. It afterwards came into possession of the crown, for it seems that king John granted it to William de Estoteville, for the services of the three knight's fees. In the succeeding reign, it was bestowed on the great justiciary, Hubert de Burgh, on payment of £100 per annum into the exchequer. In the reign of Edward II., it was in the family of the Vaux, or de Vallibus, but bestowed by that prince on his favourite, Piers Gaveston, whom he created earl of Cornwall. On his death it reverted to the crown, and continued attached thereto till 1371, when the castle, manor, and honour of Knaresborough, were granted by Edward III. to his fourth son, John of Gaunt, duke of Lancaster. In 1170, the four knights who murdered Thomas à Becket, took refuge here, where they remained prisoners many months, but were some time after pardoned, on condition of their performing a pilgrimage to Jerusalem. After the base treachery which Richard II. experienced from the earl of Northumberland, and his gallant son Hotspur Percy, that unfortunate prince was kept a close prisoner here, in an apartment still called the King's Chamber, till he was removed to Pontefract castle, and there murdered by order of Henry IV. In 1616, James I. granted this castle to his son Charles. It was a strong fortress during the civil wars, and made great resistance against the parliamentary forces. After the battle of Marston Moor, the townsmen most gallantly defended it against lord Fairfax, and, though at last compelled to surrender, it was on the most honourable terms that the garrison laid down their arms. Not long after this, it was, with many other castles, by order of the House of Commons, rendered untenable. The site of the castle commands a most beautiful view of the river, church, part of the town, Coghill Hall, dropping-well, bridge, woods, &c. The keep was large, and consisted of three stories. From an east view of it, the dismantled towers, and dilapidated arches, are finely picturesque; but the whole is fast falling into decay. Near the centre, in a part of the ruins, are the court-house and prison for the liberty of the forest of Knaresborough.

The *Dropping-Well* rises at the foot of a limestone rock. After running about twenty yards towards the river, it spreads itself over the top of a crag, about thirty feet high, from whence it falls in a shower, dropping perpendicularly very fast, and making a pleasing sound, thus gratifying the ear as well as the eye. The water, the discharge of which is reckoned at about twenty gallons a minute, is very cold, and has a petrifying quality. It soon incrusts every thing on which it falls; and visiters may be supplied with petrified wood, eggs, birds' nests, and even wigs. The petrifying property of the water of the Dropping-Well is owing to a gritty or sparry matter, which encrusts the objects it is deposited on. Mr De la Beche says, " Springs are seldom or ever quite pure, owing to the solvent property of water, which, percolating through the earth, always becomes more or less charged with foreign matter. Dr Webster describes the hot springs of Furnas [in the volcanic district of St Michael, Azores] as respectively varying in temperature from 73° to 207° Fahrenheit, and depositing large quantities of clay and siliceous matter, which envelop the grass, leaves, and other vegetable substances that fall within their reach. These they render more or less fossil. The vegetables may be observed in all stages of petrifaction." Harrowgate is about three miles from Knaresborough. The latter place had some repute as a watering resort, until the mineral springs of Harrowgate completely threw it into the shade. The chief manufacture carried on in Knaresborough is that of coarse linen. Population of the town in 1831, 5296.

KNIGHTS, TEMPLARS, (*a.* to the article *Templars.*) In the year 1119, the twentieth of the Christian dominion in Syria, nine pious and valiant knights, the greater part of whom had been the companions of Godfrey of Bouillon, formed themselves into an association, the object of which was to protect and defend pilgrims on their visits to the holy places. These knights, of whom the two chief were Hugo de Payens and Godfrey de St Omer, vowed, in honour of the *sweet mother of God* (la doce mere de Dieu), to unite monkhood and knighthood; their pious design met with the warm approbation of the king and the patriarch, and in the hands of the latter they made the three ordinary vows of poverty, chastity, and obedience; and a fourth, of combatting without ceasing against the heathen, in defence of pilgrims and of the Holy Land; and bound themselves to live according to the rule of the canons of St Augustine, at Jerusalem. The king assigned them for their abode a part of his palace, which stood close by where had stood the temple of the Lord. He and his barons contributed to their support, and the abbot and canons of the temple assigned them for the keeping of their arms and magazines the street between it and the royal palace, and hence they took the name of the soldiery of the Temple, or Templars. When Fulk, count of Anjou, in the year following the formation of the society, made a pilgrimage to the Holy Land, the order was even then in such repute that he joined it as a married brother, and on his return home remitted them annually thirty pounds of silver, to aid them in their pious labours, and his example was followed by several other Christian princes.

During the first nine years after their institution, the Templars lived in poverty and humility, and no new members joined their society. Their clothing consisted of such garments as were bestowed on them by the charity of the faithful, and so rigorously were the gifts of pious princes applied by them to their destination—the benefit of pilgrims and of the Holy Land in general—that in consequence of their poverty, Hugo de Payens and Godfrey de St Omer had but one war-horse between them. When the order had arrived at wealth and splendour, its seal, representing two knights mounted on one charger, commemorated this original poverty of its pious founders—a circumstance which has been even made a ground of accusation against them!

During the reign of Baldwin II. the kingdom was very hard pressed by the Turks of Damascus, Mossul, and the neighbouring states, and the king had been a captive in their hands. On his liberation he sought every means of strengthening his kingdom, and as the Templars had displayed such eminent valour and devotion wherever they had been engaged, he resolved to gain them all the influence and consideration in his power. Accordingly he despatched two of their members as his envoys to the Holy See, to lay before the pope the state of the Holy Land, and also furnished them with a strong letter of recommendation to the celebrated Bernard of Clairvaux, the nephew of one of the envoys. Bernard approved highly of the object and institution of the order. Hugo de Payens and five other brethren soon arrived in the west, and appeared before the fathers, who were assembled in council at Troyes, to whom Hugo detailed the maxims and the deeds of the Templars. The fathers expressed their approbation of all he said, the order was pronounced good and useful, and some additions, taken from that of the Benedictines, were made to their rule. By the direction of pope Honorius, the council appointed them a white mantle as their peculiar dress, to which pope Eugenius some years afterwards added a red cross on the breast—the symbol of martyrdom. Their banner was of the black and white stripe, called, in old French, *Bauseant* (which word became their war-cry;) and bore the pious inscription, *Non nobis, Domine, non nobis, sed nomini tuo da gloriam.* St Bernard, if he did not himself draw up this rule, had at least a considerable participation in it; throughout his life he cherished the Templars; he rarely wrote a letter to the Holy Land, in which he did not praise them, and recommend them to the favour and protection of the great.

Owing to the influence of Bernard, and the sincere piety and noble qualities of its founders, the order rapidly increased in wealth and consequence. Many knights assumed its habit, and with Hugo de Payens travelled through France and England, to excite the Christians to the sacred war. With Henry I. of England they met the highest consideration. Fulk, of Anjou, re-united himself to Hugo de Payens, and on the invitation of king Baldwin, prepared, though advanced in years, to set out for Palestine, to espouse the daughter of the king, and succeed him on his throne. Gifts in abundance flowed in on the order, large possessions were bestowed on it in all countries of the west, and Hugo de Payens, now its grand master, returned to the Holy Land in the year 1129, at the head of three hundred Knights Templars of the noblest families in Europe, and shared in the disastrous attempt on Damascus.

The Templars were, in fact, the most distinguished of the Christian warriors. By a rule of their order no brother could be redeemed for a higher ransom than a girdle or a knife, or some such trifle; captivity was therefore equivalent to death, and they always fought with Spartan desperation. The Bauseant was always in the thick of the battle; the revenue they enjoyed enabled them to draw to their standard valiant secular knights and stout and hardy footmen. The chivalry of St John vied with them, it is true, in prowess and valour, but they do not occupy the same space in the history of the Crusades. The Templars having been from the outset solely devoted to arms, the warm interest which St Bernard, whose influence was so great, took in their welfare; and the circumstance that the fourth king of Jerusalem was a member of their body—all combined to throw a splendour about them which the knights of St John could not claim, but which also gave occasion to their more speedy corruption, and augmented the number of their enemies. Most writers, however, of the twelfth century speak respectfully of the Knights of the Temple, and those unsparing satirists, the Troubadours, never mention them but with honour.

By the bull, *Omne datum optimum*, granted by pope Alexander III. in 1162, the order of the Templars acquired great importance, but with it the ill-will and envy of the bishops and the secular clergy. By this celebrated bull it was established, that the grand master could only be chosen by the order; that no Templar could be, on any account, obliged to take an oath; that no one who had been received into the order could enter any other without leave of the grand master and the chapter; that the order should be free from the obligation of paying tithes; that it might admit spiritual persons into it, who should not, however, meddle with the affairs or the chapter of the order unless when required. As the bishops, however, retained their rights over these latter, they could not be buried at the temple courts without the consent of the bishops, for the Templars had peculiar chapels and burial-places at their houses. With the consent of the bishop and chapter, the order might levy tithes, or employ other spiritual persons when none of their own were at hand. But one of the most important privileges, (which had however been already granted them, in 1147, by Eugenius III.,) was, that when they came to make their collections in any place which was under interdict, they might have the churches opened once in the year, and divine service performed there, to which the excommunicated were admitted.

From this time forth the order may be regarded as totally independent, acknowledging no authority but that—before which the haughtiest monarchs bowed—of the supreme pontiff, who protected and favoured them as his champions against all who might dispute his will. The order consisted of three distinct classes, not degrees—knights, chaplains, and serving-brethren, to which may be added those who were attached to the order under the name of *affiliated*, *donates* and *oblates*.

The strength and flower of the order were the knights; all its dignities and superior offices belonged to them. The candidate for admission among the knights of the temple was required to produce proof of his being the lawful issue of a knight, or of one qualified to receive that distinction; and he must himself have already received the honour-conferring blow from a secular knight, for the order was spiritual, and its members could not deign to accept honour from a layman. The only exception was in the case of a bishop, who might draw his sword among the brethren of the temple, without having been a secular knight. The aspirant must moreover be free from debt, and, on admission, pay a considerable sum into the hands of the society. The most unlimited obedience to the commands of his superiors in the house and in the field of battle; the total abnegation of all interests but those of the society, (for the Templar could hold no property, could receive no private letter); the most unflinching valour, (for so long as a Christian banner waved in the field the Templar, however severely wounded, must not abandon it,)—were the duties of the knight of the Temple. If he fled, disgrace and punishment awaited him; if he surrendered, he had to end his life amid the torments inflicted by the enraged Moslems, or to languish in perpetual captivity, for the order never redeemed its members. Hence then the Templar was valiant as the fabled heroes of romance; hence prodigies of prowess, such as almost surpass belief, so frequently illustrate the name of the soldiers of the temple. Every motive that could stimulate to deeds of renown combined to actuate the soldier-monk. A knight, he obeyed the call of honour and emulation; a monk, (but the Templar was not, as some erroneously fancy, a priest,) he was, according to the idea of the times, engaged in the service most acceptable to God.

The mode of reception into the order corresponded with the dignity and importance of the character of a Knight Templar. Though a noviciate was enjoined by the original canons, in practice it was dispensed with; the candidate was, after all due inquiry had been made, received in a chapter assembled in the chapel of the order. All strangers, even the relatives of the aspirant, were excluded. The preceptor (usually one of the priors) opened the business with an address to those present, calling on them to declare if they knew of any just cause and impediment to the aspirant, whom the majority had agreed to receive, becoming a member of their body. If all were silent, the candidate was led into an adjacent chamber, whither two or three of the knights came to him, and setting before him the rigour and strictness of the order, inquired if he still persisted in his desire to enter it. If he did persist, they inquired if he was married or betrothed; had made a vow in any other order; if he owed more than he could pay; if he was of sound body, without any secret infirmity, and free? If his answers proved satisfactory, they left him and returned to the chapter, and the preceptor again asked if any one had anything to say against his being received. If all were silent, he asked if they were willing to admit him. On their assenting, the candidate was led in by the knights who had questioned him, and who now instructed him in the mode of asking admission. He advanced, kneeling, with folded hands, before the preceptor, and said, "Sir, I am come before God, and before you and the brethren; and I pray and beseech you, for the sake of God and our sweet lady, to receive me into your society and the good works of the order, as one who, all his life long, will be the servant and slave of the order." The preceptor then questioned him, if he had well considered all the toils and difficulties which awaited him in the order, adjured him on the Holy Evangelists to speak the truth, then put to him the questions already asked by the knights, farther inquiring if he was a knight, the son of a knight and a gentlewoman, and if he was a priest. He then asked if he would promise to God and Mary, our dear lady, obedience, as long as he lived, to the master of the temple, and the prior who should be set over him; chastity of his body; compliance with the laudable manners and customs of the order then in force; and such as the master and knights might hereafter add; fight for and defend, with all his might, the holy land of Jerusalem; never quit the order, but with consent of the master and the chapter; never see a Christian unjustly deprived of his inheritance, or be aiding in such deed. The preceptor then said—"In the name, then, of God and of Mary, our dear lady, and in the name of St Peter of Rome, and of our father the pope, and in the name of all the brethren of the temple, we receive you to all the good works of the order, which have been performed from the beginning, and will be performed to the end, you, your father, your mother, and all those of your family whom you let participate therein. So you, in like manner, receive us to all the good works which you have performed and will perform. We assure you of bread and water, the poor clothing of the order, and labour and toil enow." The preceptor then took the white mantle, with its ruddy cross, placed it about his neck, and bound it fast. The chaplain repeated the one hundred and thirty-second psalm, *Ecce quam bonum*, and the prayer of the Holy Spirit, *Deus qui corda fidelium*, each brother said a *Pater*, the preceptor kissed the new brother, the chaplain did the same. The Templar then placed himself at the feet of the preceptor, and was by him exhorted to peace and charity with his brother Christians; to chastity, obedience, humility, and piety; and thus the ceremony concluded.

The Templars had at first no clergy in their body; in spiritual matters they were subject to the patriarch of Jerusalem, and attended service in the church of the holy sepulchre, or they had priests assigned them by the patriarch or other bishops, who lived in their houses, but were subject to the bishop of the diocese. But the bull, "*Omne datum bonum*," which gave them exemption, enabled them to have priests of their own, independent of the prelates. These they generally took out of the regular orders, chiefly the Minorites, and the mode of reception was the same as that of the knights, omitting such questions as did not apply to them. The dress of these was white, consisting of a close-fitting coat, like that of the Cistercians, with the red cross on the breast; but they could not wear the white mantle, unless they enjoyed the episcopal dignity. They were appointed by the statutes the best clothes of the order. Besides their spiritual duties, they acted as secretaries, being possessed of all the learning of the order, the knights of the temple, in that point, little transcending their secular brethren. The chaplains sat in the chapter and the refectory next to the master; at table, they were the first helped; in punishment, they were more gently dealt with than the knights.

It is plain that the order, at its origin, could have had no serving brethren. But when it grew in consequence, and acquired lands and houses, the necessity of such a class was found, and those who were neither knights nor priests were admitted into it. They were received nearly in the same manner as the knights, with the necessary modification of the questions put to them; they originally wore the white dress, till, on account of some irregularity, they were assigned a black or brown dress, with the distinguishing red cross. Many of the serving brethren were of wealthy and respectable, though not noble families. They were divided into two classes, the brother armour-bearers and the brother artizans; the former attended the knights to battle, as squires, or as foot-soldiers and baggage-train; they were on a footing of great intimacy with the knights, ate in the same refectory with them and the clergy, but had one dish less at their table. The brother artizans lived and exercised their trades in the service of the order, on its various estates, and its various preceptories. Almost every trade found its representative among them; the armourer and the cook were the most distinguished. Such offices of the order as were beneath the dignity of the knights, were exercised by the serving brethren. Thus, the preceptor of the coast of Acre was always one of them, as his place was a sort of commissariat, directed to the shipping and unshipping of men and stores.

It has always been, and is, we believe, at the present day, a practice of the Romish church, for members of the laity to attach themselves to particular religious orders, binding themselves to some of the minor obligations, and enjoying the advantages of its sanctity and power. These persons were called *Affiliated*. The splendour which soon surrounded the Templars, and their privilege of exemption from the ill effects of interdicts, drew numbers to seek to affiliate themselves with them, and wealthy burghers often paid largely for these advantages; married persons were not obliged to put away their wives, but bound themselves to a cessation of all intercourse, and on their death their whole property, reserving a provision for the widow, came to the order. These brethren did not wear its habit, but were bound on all occasions to further its interests. The donates and oblates consisted of persons who gave themselves and their property to the order, of children who were dedicated to it and were to take the rule when of sufficient age, or lastly, persons who vowed to serve the order all their life long without reward. Even princes and nobles were numbered among its donates, who exchanged their temporal for its spiritual blessings. These different classes constituted the order, but numerous knights and esquires frequently received its pay, and fought under its banner.

So large and extensive a society required numerous officers to direct it, and regulate its affairs and operations. At its head stood the grand master, who, like the general of the Jesuits in modern times, was independent of all authority but that of the sovereign pontiff. The residence of the grand-master was the city of Jerusalem; when that city was lost, he fixed his seat at Antioch, next at Acre, then at the castle of the pilgrims between Caiphas and Cæsarea, and finally in Cyprus, for his duty required him to be always in the Holy Land. The grand master never resided in Europe. It was necessary that he should be a knight, and his election took place in the following manner:—On the death of a grand-master, a grand-prior was chosen to administer the affairs of the order during the interregnum, and he, in conjunction with the principal members, fixed the day for the election of the new grand-master. When the appointed day arrived, the chapter usually assembled at the chief seat of the order; three or more of the most esteemed knights were then proposed, the grand-prior collected the votes for each of these, and whoever had the most was nominated to be the electing prior; an assistant was then associated with him in the person of some knight of high estimation. These two remained all night alone in the chapel engaged in prayer. Early next morning the knights again assembled, the mass of the Holy Ghost was sung, and prayer made in the chapel, and then the grand-prior exhorted the two brethren to perform their office faithfully. These two then left the chapel, and chose two others; these four chose two more, and so on till the number of twelve (that of the apostles) was completed. The twelve then chose a chaplain to represent our Lord. These thirteen were required to be all honest and generally esteemed men, eight of them knights, four serving brethren, and one priest. Having been sworn by the grand-prior to act justly and honestly in their office, the thirteen retired, and after invocation of the Holy Spirit, commenced the election. The majority of voices decided; if they could not agree, the prior and one of the knights returned to the chapter to announce their disagreement, and prayer was made for the grace of the Holy Ghost. When the election was made, it was announced to the assembled brethren, and when all had promised obedience to the new grand-master, the electing prior asked the grand-prior and some of the most distinguished knights, if they would, if chosen, promise obedience during life to the chapter, and to maintain the manners and usages of the order. On receiving a satisfactory reply, the prior, if the person chosen was present, said to him "In the name of God the Father, the Son, and the Holy Ghost, we have chosen, and do choose thee, brother N., to be our master." Then, turning to the brethren, he said, "Beloved sirs and brethren, give thanks unto God, behold here our master." The chaplains then recited the *Te Deum*, the brethren stood up, and led the master before the altar in the chapel, where, with prayer and singing, the election was closed.

The power of the grand-master was considerable, though he was very much controlled by the chapter, without whose consent he could not dispose of any of the higher offices, or undertake any thing of importance. He could not, for instance, take money out of the treasury, without the consent of the prior of Jerusalem; he could neither make war or truce, or alter laws, but with the approbation of the chapter. But the grand-master had the right of bestowing the small commands, the governments of houses of the order, and of selecting the brethren who should form the chapter, which power was again controlled by there being always assigned him two brethren as assistants, who, with the Seneschal, were to form a part of every chapter. The order was aristocratic rather than monarchic; the grand-master was like a Doge of Venice, and his real power chiefly depended on his personal qualities; he had, however, many distinctions; the greater part of the executive power was in his hands—in war he was the commander-in-chief; he had, as vicar-general of the pope, episcopal jurisdiction over the clergy of the order; he ranked with princes, and his establishment corresponded thereto; he had for his service four horses, a chaplain, two secretaries, a squire of noble birth, a farrier, a Turcopole and cook, with footmen, and a Turcoman for a guide, who was usually fastened by a cord to prevent his escape. When the grand-master died, his funeral was celebrated with great solemnity by torch-light, all the knights attending.

The chief officers of the order at Jerusalem were 1. the Seneschal, that is, the deputy of the grand-master; he had, like the master, the seal of the order, and had the same retinue with him; 2. the Marshal, who was the general, carried the banner of the order, and regulated every thing relating to war; the horses and equipments of the order were under him; he had four horses, two esquires, a serving brother, and a Turcopole; 3. the Treasurer; 4. the Drapier, who provided and regulated the clothing of the brethren; he had four horses, two esquires, and a servant to pack and unpack his goods; 5. the Turcopoler, who commanded the light cavalry of squires and serving brethren, who were called Turcopoles, the name given by the Greeks to those who were born of a Turk and a Christian, and who were employed as light troops in the imperial service; 6. the Prior of Jerusalem, whose office was, with ten knights, to accompany and protect the pilgrims on their way to the Jordan, and to guard the cross whenever it was brought into the field. All secular knights, who were friends to the order, fought under his banner; he too had four horses, two esquires, a serving brother, a secretary, and a Turcopole.

Each province of the order had a grand-prior, who represented in it the grand-master; each house had its prior or preceptor at its head, who commanded its knights in war, and presided over its chapters in peace. Various offices were filled by serving brethren, such as those of sub-marshal, standard-bearer, farrier, and, as already noticed, prior of Acre. The standard-bearer commanded those esquires who were not brethren of the order; he rode before the standard, which was borne by an esquire, or was carried on a carriage; he was assigned two horses.

To complete this sketch of the order of the Templars, it is necessary to take a view of the extent of their possessions in the east and in the west. These they divided into provinces; those in the east were—

1. Jerusalem, in which were 1. the Temple at Jerusalem; 2. the Castle of the Pilgrims; 3. that of Saphet at the foot of Tabor; 4. their house at Acre; 5. the Castle of Gaza, and eight or more other houses and castles.

2. Tripolis, in which they had houses at Tortosa, Laodicea, Tyre, Sidon, and Berytus.

3. Antioch, their establishments in which are not known.

4. Cyprus, which became their chief seat after the loss of Acre.

In the west they had 1. the province of Portugal, where their chief seat was Tomar; 2. Castile and Leon, in which they had twenty-four preceptories; 3. Arragon, where they had also considerable possessions; 4. France and Auvergne, including Flanders and the Netherlands; 5. Normandy; 6. Aquitaine or Poitou; 7. Provence. These four provinces (somewhat more than modern France) were the chief seats of the Templars, in which their lands and houses were exceedingly numerous and extensive; 8. England, (including Scotland and Ireland) where they had several houses, as in London, York, Warwick, Lincoln, Bolingbroke, &c. and the grand-prior sat in the parliament of the realm; 9. Upper Germany, containing Austria, Bavaria, Swabia, Franconia, Alsatia, Lorraine, and the Rhinelands; 10. Brandenburg, containing Poland, Saxony, Westphalia, Thuringia, &c.; 11. Bohemia and Moravia; 12. Upper and Middle Italy; 13. Apulia and Sicily.

We thus see that, except Scandinavia (for they had some possessions in Hungary) there was not a country in Europe in which the lavish piety of princes and nobles had not bestowed on the Templars a considerable portion of the wealth of the state; for in every province the order had its churches and chapels—the number of which was in the year 1240 as great as 1050—villages, farmhouses, mills, cornlands, pastures, woods, rights of venison and fisheries. The revenues of the Templars in England in 1185, as given by Dugdale, will afford some idea of their wealth. The entire annual income of the order has been estimated at not less than six millions sterling.

Probably from the reasons assigned above, the wealth, the consideration, and the influence of the Templars greatly exceeded those of the Hospitallers, and in these points the Teutonic knights and those of St Lazarus, the two other similar orders, could far less stand in competition with them. The valour of the Templars, too, though not perhaps at all superior to that of the knights of the other orders, was without reproach, and Bauseant was rarely seen to give back in the fray. "The Templars," says de Vitry, "were always the first in attack, the last in retreat." But envy or disappointed expectation would occasionally lay the blame of defeat on the treachery of the soldiers of the temple; even the defeat and capture of St Louis, in his preposterous invasion of Egypt, is by one writer charged on them; most assuredly without reason. The only act of the kind, with which they may be perhaps justly charged, is in the case of the emperor Frederic II.; for when this monarch in his expedition to the Holy Land was about to pay a secret visit to the Jordan, the Templars wrote to give the sultan information of it, that he might seize him, but that prince sent the letter to Frederic. Yet even in this instance the conduct of the Templars was not wholly without excuse; they were not solitary in their opposition to the emperor, who was then lying under the ban of the pope, whose firm supporters these knights had ever been; and the Hospitallers are even said to have been parties in writing to the sultan. Frederic, therefore, on his return, did all the injury in his power to the order, by seizing its property in Sicily and Naples; but the heaviest charge he was able to bring against them was, that of admitting infidel sultans and their heirs within their walls, and suffering them there to invoke their false prophet, a charge that implies nothing more than a participation in the spirit of mutual tolerance and courtesy which had grown up from acquaintance between the warlike followers of the hostile religions. But the history of the order, as far as we can recollect, records only one instance of a Templar abjuring his faith, and that was an English knight, Robert of St Albans, who deserted to Saladin, who gave him his sister in marriage on his becoming a Moslem; and in 1185, the ex-red-cross knight led a Saracen army to the neighbourhood of Jerusalem, wasting and destroying the country with fire and sword.

Their enormous wealth, their overweening pride, the disdainful neglect of the rules of their order, their close attachment to the popes and their interests, the excessive exemptions and privileges they enjoyed, their luxury, their sensuality—these were the true causes of the enmity borne to them by the secular clergy and the laity. In 1252 the pious pope-ridden Henry III. of England said, that the prelates and clergy in general, but especially the Templars and Hospitallers, had so many liberties and privileges, that their excessive wealth made them mad with pride; he added, that what had been bestowed imprudently, ought to be prudently resumed, and declared his intention of revoking the inconsiderate grants of himself and his predecessors. The grand-prior of the Templars replied, "What sayest thou, my lord the king? Far be it that so discourteous and absurd a word should be uttered by thy mouth. So long as thou observest justice thou mayest be a king, and as soon as thou infringest it, thou will cease to be a king." A bold expression certainly, but the prior knew his man well, and he would hardly have spoken so to the son of Henry. The anecdote of Richard I. bestowing his daughter Pride in marriage on the Templars is well known; and numerous traits of their haughtiness, avarice, luxury, and other of the current vices, may be found in the writers of the thirteenth century; but till the final attack was made, no worse charge was brought against them, unless such is implied in a bull of pope Clement IV. in 1265, which is, however, easily capable of a milder interpretation. Mr Raynouard asserts, too, that the proverbial expression *bibere Templariter* is used by no writer of the thirteenth century. In this he is preceded by Baluze and Roquefort, who maintain, that, like *bibere Papaliter*, it only signified to live in abundance and comfort.

When Acre fell in 1292, the Templars, having lost all their possessions and a great number of their members in the Holy Land, retired with the other Christians to Cyprus. Having probably seen the folly of all hope of recovering the Holy Land, they grew indifferent about it; few members joined them from Europe, and it is not unlikely that they meditated a removal of the chief seat of the order to France; at least the circumstance of the last master carrying so much treasure with him when summoned to Europe by the pope, gives great probability to this conjecture. The Hospitallers, on the other hand, with more prudence, as events showed, resolved to continue the war against the infidels, and they attacked and conquered Rhodes; while the Teutonic knights transferred the sphere of their pious warfare to Prussia, against its heathen inhabitants. Thus, while the Templars were falling under the reproach of being false and worthless knights, their rivals rose in consideration, and there was an active and inveterate enemy ready to take advantage of their ill-repute.

Philip the Fair, a tyrannical and rapacious prince, was at that time on the throne of France. His darling object was to set the power of the monarchy above that of the church. In his celebrated controversy with pope Boniface, the Templars had been, as usual, on the side of the Holy See. Philip, whose animosity pursued Boniface even beyond the grave, wished to be revenged on all who had taken his side; moreover, the immense wealth of the Templars, which he reckoned on making his own if he could destroy them, strongly attracted the king, who had already tasted of the sweets of the spoliation of the Lombards and the Jews; and he probably, also, feared the obstacle to the perfect establishment of despotism which might be offered by a numerous, noble, and wealthy society, such as the Templars formed. Boniface's successor, Clement V. was the creature of Philip, to whom he owed his dignity, and at his accession had bound himself to the performance of six articles in favour of Philip, one of which was not expressed. It was probably inserted without any definite object, and intended to serve the interest of the French monarch on any occasion which might present itself.

It had been the project of pope Boniface to form the three military orders into one, and he had summoned them to Rome for that purpose, but his death prevented it. Clement wrote, June 6, 1306, to the grand-masters of the Templars and the Hospitallers, inviting them to come to consult with him about the best mode of supporting the kings of Armenia and Cyprus. He desired them to come as secretly as possible, and with a very small train, as they would find abundance of their knights this side the sea; and he directed them to provide for the defence of Limisso in Cyprus during their short absence. Fortunately perhaps for himself and his order, the master of the Hospitallers was then engaged in the conquest of Rhodes, but Jacques de Molay, the master of the Templars, immediately prepared to obey the mandate of the pope, and he left Cyprus with a train of sixty knights, and a treasure of 150,000 florins of gold, and a great quantity of silver money, the whole requiring twelve horses to carry it. He proceeded to Paris, where he was received with the greatest honour by the king, and he deposited his treasure in the temple of that city. It is, as we have said, not impossible that it was the intention of Molay to transfer the chief seat of the order thither, and that he had, therefore, brought with him its treasure and the greater part of the members of the chapter. At all events, he had no suspicion of the king or the pope; and perhaps at that time there was no just ground for suspecting either of them, though the letter of Clement to Philip in August, 1305, proves that the king had already accused the order to the pope of some "almost incredible and impossible matters," and that the heads of it had challenged inquiry. Shortly afterwards Molay proceeded to Poitiers, as the pope wished to consult with him respecting the recovery of the Holy Land and the union of the orders. On the former subject the opinion of the grand-master was, that nothing short of a union of all the powers of Christendom would suffice; the latter he objected to on various grounds, one of which was, that they would disagree, inasmuch as the Templars were liberal of their goods, the Hospitallers avaricious, and farther, that the Templars were more esteemed and supported by the laity; he also dwelt on the superior strictness and austerity of the mode of life of his own order. He acknowledged, however, that the new order would be more powerful against the heathen than the two separate ones, and that it could be managed at less expense. The grand-master was then dismissed by the pope, and he returned to Paris.

It is difficult to say how early the project of attacking the Templars entered into the minds of Philip and his obsequious lawyers, or whether he originally aimed at more than mulcting them under the pretext of reformation; and farther, whether the first informers against them were suborned or not. The remaining records leave a considerable degree of obscurity on the whole matter. All we can learn is, that a man named Squin de Flexian, who had been prior of the Templars, and had been put out of the order for heresy and various vices, was lying in prison at Paris or Toulouse, it is uncertain which. In the prison with him was a Florentine named Noffo Dei, "a man," says Villani, "full of all iniquity." These two began to plan how they might extricate themselves from the confinement to which they seemed perpetually doomed. The example of the process against the memory of pope Boniface showed them that no lie was too gross or absurd not to obtain ready credence, and they fixed on the Templars as the objects of their true or false charges. Squin told the governor of the prison that he had a communication to make to the king, which would be of more value to him than if he had gained a kingdom, but that he would only tell it to the king in person. He was brought to Philip, who promised him his life, and he made his confession, on which the king immediately arrested some of the Templars, who are said to have confirmed the truth of Squin's assertions. Shortly afterwards, it is said, similar discoveries were made to the pope by his chamberlain, cardinal Cantilupo, who had been in connection with the Templars from his eleventh year.

Squin Flexian declared, 1. that every member on admission into the order swore on all occasions to defend its interests right or wrong; 2. that the heads of the order were in secret confederacy with the Saracens, had more of Mohammedan unbelief than of Christian faith, as was proved by the mode of reception into the order, when the novice was made to spit and trample on the crucifix, and blaspheme the faith of Christ; 3. that the superiors were sacrilegious, cruel, and heretical murderers; for if any novice, disgusted with its profligacy, wished to quit the order, they secretly murdered him, and buried him by night; so, also, when women were pregnant by them, they taught them how to produce abortion, or secretly put the infants to death; 4. the Templars were addicted to the error of the Fraticelli, and, like them, despised the authority of the pope and the church; 5. that the superiors were addicted to the practice of an unnatural crime, and if any one opposed it, they were condemned by the master to perpetual imprisonment; 6. that their houses were the abode of every vice and iniquity; 7. that they endeavoured to put the Holy Land in the hands of the Saracens, whom they favoured more than the Christians. Three other articles of less importance completed this first body of charges. It is remarkable, that we do not find among them those which make such a figure in the subsequent examinations; namely, the devil appearing among them in the shape of a cat; their idolatrous worship of an image with one or three heads, or a skull covered with human skin, with carbuncles for eyes, before which they burned the bodies of their dead brethren, and then mingled the ashes with their drink, thereby thinking to gain more courage; and finally their smearing this idol with human fat.

The historians do not precisely state the date of Squin Flexian's confessions, or whether they were prior to the month of April, 1307, in which month Jacques de Molay, accompanied by the preceptors of Beyond-sea, Poitou, Aquitaine, and France, repaired to the pope at Poitiers, to justify the order from the imputations of corruption every day cast upon it, in which, as he thought, he succeeded, and again returned to Paris. Philip having now all things prepared, sent, like his descendant Charles IX. previous to the St Bartholomew massacre, secret orders to all his governors to arm themselves on the 12th of October, and on the following night, but not sooner on pain of death, to open the king's letter, and act according to it. On Friday the 13th of October, all the Templars throughout France were simultaneously arrested at break of day. In Paris, on the following day, the heads of the university assembled in the church of Notre Dame, where in their presence, and several of the royal officers, the chancellor Nogaret accused the knights of their heresies. On the 15th the university met at the temple, where the grand-master and some of the heads of the order were examined, and are said to have acknowledged the truth of the charges. The king, who was anxious to carry the people with him, had now the act of accusation drawn up, in which the knights are designated as ravenous wolves, perjurors, idolaters, and in general as the vilest of men. This act was read to the citizens, assembled in the royal gardens. He also sent to Edward II. of England, inviting him to follow his example, but Edward was reluctant to proceed to any extremities; he wrote on the 30th October, declaring that the charges appeared to him and his barons and prelates, to be incredible, but that he would write to the seneschal of Agers in Güienne, who was nearer to the country where the reports prevailed, to make inquiry. On the 10th December, after inquiry had been made by the seneschal, Edward wrote to the pope, stating, that a horrible rumour was abroad respecting the Templars, who should be severely punished if it was found to be true, but that he could give no credit to it, and prayed the pope to institute an inquiry. He had previously (December 4th) written to the kings of Portugal, Castile, Arragon, and Sicily, stating that a priest (Philip's envoy) had been lately urging him to suppress the order, accusing it of heresy, but that in consideration of the great merits of the order he had given no credit to these insinuations; and he besought these monarchs to pay no attention to the rumours against it. But Clement had put forth a bull (November 22) stating the charges against the Templars, and calling on the king of England to imprison them, and take their goods into safe keeping. To this Edward yielded obedience, and on the Wednesday of the Epiphany the English knights were arrested, but the king gave directions that they should be treated with all gentleness. Orders were sent to Ireland, Scotland, and Wales, to the same effect, and Edward wrote to the pope to assure him of obedience.

Meantime Philip and his chief agents were not remiss. These were, his confessor, William Imbert, a dominican, member, therefore, of an order hostile to the Templars, and well versed in inquisitorial arts; William Nogaret, the chancellor, the man who had dared to seize pope Boniface at Anagni; William Plesian, who had also borne a part in that bold deed, and afterwards swore in the presence of the peers and prelates of France, that Boniface was an atheist and sorcerer, and had a familiar devil; and several others of the same stamp, all likely to prove gentle judges! The unhappy knights had been thrown into cold cheerless dungeons, (for they were arrested, we should remember, at the commencement of winter,) had barely the necessaries of life, were deprived of the habit of their order, and of the rites and comforts of the church; were exposed to every species of torture then in use; were shown a real or pretended letter of the grand-master, in which he confessed several of the charges, and exhorted them to do the same; and finally were promised life and liberty, if they freely acknowledged the guilt of the order. Can we then be surprised that the spirit of many a knight was broken, that the hope of escape from misery, even at the cost of disgrace, was eagerly caught at, and that falsehoods, the most improbable, were acknowledged to be true? At a subsequent period one Templar thus expressed himself before the papal commissioners:—"I have seen the fifty-four knights conveyed in carts to be committed to the flames, because they would not make the required confessions; I have heard that they were burned; and I doubt if I could, like them, have the noble constancy to brave the pile. I believe that if I were threatened with it, I should depose on oath before the commissioners and before all who would ask me, that the enormities imputed to the knights are true; that I should kill God himself if required; and he implored all present not to let the king's officers know what he had said, lest they should commit him to the flames." This shows the value to be set on confessions extracted by the rack, or the fear of it, for this last kind are those which were termed *voluntary*. The papal commission even declared, that terror had deprived several of the witnesses (the imprisoned Templars) of their senses.

It is remarkable that the most improbable charges are those which were most frequently acknowledged, so just is the observation, that men will more readily in such circumstances acknowledge what is false than what is true; for the false they know can be afterwards refuted by its own absurdity, whereas truth is permanent. There is no improbability whatsoever in supposing, that the Templars, in common with all the religious orders, were obnoxious to the charge of unnatural lust, though certainly not as a rule of their society; and it is by no means unlikely, that deism may have prevailed to some extent among their members, owing to their intercourse with the Moslems. Yet no Templar confessed himself guilty of either one or the other, though enough deposed to the worship of the head and the spitting on the cross. How, we may ask, could deism and the grossest idolatry combine? and does not the charge of their having learned the latter from the Saracens carry its own refutation with it? How many brave knights expired amidst tortures, sooner than confess these absurd falsehoods, as we must term them? how many recanted their first declarations, and sealed with their blood their avowal of the innocence of the order? Is there not eternal and irreconcilable contradiction between the depositions of the different parties, or of the same parties at different times? Does not terror of the rack visibly pervade every one of the confessions? How different, too, is the conduct of the accused before the papal commission, where there was some chance of justice and mercy, and before the royal bloodhounds, where there was none!

But truth is one, and the order was one—inquiry must then have brought similar enormities to light in other countries, if they existed. From the additions which the archives of the Vatican have enabled Münter to make to the pieces in Wilkins's Consilia, our account of the process against the Templars in England is tolerably complete. Of the Templars themselves 228 were examined; the Dominican, Carmelite, Minorite, and Augustinian friars brought abundance of hearsay evidence against them, but nothing of any importance was proved; in Castile and Leon it was the same; in Arragon the knights bravely endured the torture, and maintained their innocence; in Germany all the lay witnesses testified in their favour; in Italy their enemies were more successful, as the influence of the pope was there considerable, yet in Lombardy the bishops acquitted the knights. Charles of Anjou, the cousin of Philip and the foe of the Templars, who had sided with Frederic against him, could not fail, it may be supposed, in getting some evidences of their guilt in Sicily, Naples, and Provence. It is not undeserving of attention, that one of these witnesses, who had been received into the order in Catalonia, (where all who were examined had declared the innocence of the order,) said he had been received there in the usual impious and indecent manner, and mentioned the appearance and the worship of the cat in the chapter! Such is the value of rack-extorted testimony! In fine, in every country out of the sphere of the immediate influence of Clement, Philip, and Charles, the general innocence of the order was acknowledged.

Confessions made on the rack, where even every sigh and groan was malignantly noted down, are generally allowed to be of little value; but some stress is laid on the circumstance of seventy-two Templars having confessed (June 29 and 30, 1308,) in presence of the pope without the appliance of any torture. But these, Mr Raynouard asserts, had been already subjected to that discipline, and had given way under it. All did not repeat their previous declarations; Jean de Valgellé protested afterwards before the papal commission at Paris, that he had confessed nothing to the pope, and several of them revoked their depositions, and died asserting the innocence of the order. The grand-master and the priors demanded to be brought before the pope, to defend themselves and the order; they were brought as far as Chinon, within a few miles of his abode, but on some frivolous pretexts were prevented from seeing him; and when what was called their declaration was afterwards read to them, the grand-master crossed himself several times with amazement at the falsehoods which had been inserted in it. Throughout the entire process from Oct. 1307, to May, 1312, the most determined design of the king and his ministers to destroy the order meets us at every step; Philip would have blood to justify robbery; several Templars had already expired on the rack, perished from the rigour of their imprisonment, or died by their own hands; but on the 12th May, 1310, fifty-four Templars who had confessed, but afterwards retracted, were by his order committed to the flames in Paris as relapsed heretics. They endured with heroic constancy the most cruel tortures, asserting with their latest breath the innocence of the order, though offered life if they would confess, and implored to do so by their friends and relatives. Similar executions took place in other towns. The pope soon went heart and hand with Philip. In vain did the bishops assembled at Vienne propose to hear those members who came forward as the defenders of the order. A bull of the pope dissolved the order, and transferred its possessions to the knights of St John, who, however, had to pay such enormous fines to the king and pope before they could enter on them, as almost ruined them; so that if Philip did not succeed to the utmost of his anticipations, he had little reason to complain of his share. The members of the society of the Templars were permitted to enter that of the Hospitallers, a strange indulgence for those who had spitten on the cross and practised unnatural vices! In Portugal the order was not even suppressed; it only changed its appellation, becoming that of Christ.

The grand-master and the four principal dignitaries of the order still languished in prison. They were brought before a commission, composed of the cardinal of Albano and two other cardinals, the archbishop of Sens, and some prelates; as, according to the proceedings, they had all confessed, they were (March 11, 1314,) brought out before the cathedral of Paris to hear their sentence read, which condemned them to perpetual imprisonment. Scarcely had the cardinal of Albano commenced reading, when he was interrupted by the grand-master and the commander of Normandy, who protested their innocence, and retracted all the confessions they were said to have made. The prelates, in surprise, directed the provost of Paris to keep them safe till the morrow, that they might deliberate respecting them, but Philip, who was at hand, declared them relapsed, and had them burned that very evening. While life and articulation remained they protested their innocence. We give implicit credit to the dying declaration of Cranmer—should we refuse it to that of Jacques de Molay?

In examining the origin and history of this order, the spirit of its institution, and the character of its members, an accusation of heresy is certainly the last which we should have suspected it to have incurred.—Founded solely for the purpose of protecting and extending the Christian faith, the names of infidel and enemy were equivalent in their mouths, and from their solemn vow of rendering justice to all, the Saracens alone were excepted. During their long and valiant struggles with the enemies of the cross, they seem never to have forgotten the objects of their institution, and, though occasional jealousies broke out between them and the other Crusaders, their enemies had never the audacity to charge them with deserting the standard of their faith, even in the most perilous extremity of its hazard. Whatever schemes of ambition might have actuated the various sovereigns who, at different times, sought to reclaim Palestine from the hands of the infidels, it could only have been a pure enthusiasm which led these misguided warriors to the burning plains of Syria. Nor did their faith waver on more trying occasions. When six hundred of the knights had been made prisoners by the Sultan of Egypt, who, meting out to the Christian soldiers the same mercy which the Saracens experienced at their hands, offered to them the alternatives of apostacy or death, the Templars at once preferred all the terrors of the sword to the shame of staining their names with the imputation of cowardice, or the sin of apostacy. It must have required a longer period, and very different occupations from those in which the Templars were engaged, so far to have corrupted the spirit and sentiments of the order as to reduce them to the degree of irreligion and depravity, into which the evidence of their accusers would make us believe they were plunged. As far as regards their moral character, it is probable that the accusations against them were better founded, though the stress which was laid on their lapse into infidelity and heresy, rather tends to show that the charges of immorality were by no means considered as the strong part of the case.

But the character and treatment of the witnesses, furnish by far the strongest grounds for concluding that the proceedings against this valiant and suffering body of men, were, in the highest degree, unjust and tyrannical. Life, liberty, and riches, were offered to such of the knights as would confess the guilt of their order. The fear of death had few terrors for men who had so often faced it, with weaker inducements to firmness, and, at last, their persecutors, speculating on the very virtue and fidelity of the accused, presented certain forged letters, which they affirmed had been received from the grand-master, inviting them to avow their guilt, in hopes that their oath of obedience might thus be turned to their destruction. Even this artifice was unsuccessful, and torture was resorted to, as the speediest method of arriving at the truth. It is revolting to dwell upon scenes like these, and were it not for the awful moral lesson which they inculcate, and the salutary jealousy of all tyrannical power which they necessarily inspire, we should wish that the page of history, which is blotted with such details, were erased from the volume for ever. The unfortunate Templars, seized and imprisoned, stripped of the habit of their order, and despoiled of the rich possessions which might have rivalled the treasures of kings, were delivered over to the tender mercies of their examiners. With scrupulous fidelity, the secretary noted down, not only their confessions, while enduring the process of the torture, but even their exclamations of anguish, their sighs, their groans, and their tears. And well might the endurance of the bravest knights sink under the accumulated inflictions of the processes to which they were subjected. All the various tortures of the inquisition seem to have been applied. Sometimes, the victim, being stripped naked, had his hands tied behind him, and a heavy weight attached to his feet, and was thus hoisted into the air by a rope tied to his hands, and passing through a pulley in the ceiling. This torture was occasionally varied by letting the rope slip, and then suddenly retaining it, so that the shock generally dislocated some of the limbs, and caused the most extreme anguish. Fire, too, was another expedient of these anxious friends of justice to elicit the truth. The naked feet of the sufferer were placed in an instrument from which he could not disengage them, and, being continually anointed with some unctuous matter, they were thus exposed to a powerful fire. Sometimes, on being questioned upon his guilt, a board was placed between him and the fire, and, if he persisted in his denials, he was again exposed to the blaze. Such, amongst others, were the ordinary tortures to which all accused of heresy were occasionally subjected; but, in the case of the Templars, a still more recondite system of torments was employed. One of the witnesses declared, that he had been so long and so frequently exposed to the torture of fire, that the flesh of his heels had been burnt off to the bone. Tortures even of a more shocking description were made use of, from which the heart turns with disgust and abhorrence. Many of the French knights perished under these inflictions, and some, yielding to the weakness of human nature, confessed every thing which their enemies required from them; but of these many afterwards retracted their confessions, thinking it better to suffer the punishments assigned to relapsed heretics, than to preserve their lives and liberty under the heavy load of treachery and conscious guilt. Such were the means used to procure testimony against the order from the knights themselves, and although some other witnesses were produced, yet the question of their guilt was evidently considered by their persecutors to rest almost entirely on these confessions. Nothing however proves more strongly the weakness and falsity of the charges than the framing of the questions which were put to the witnesses against the order, and which are ingeniously contrived to produce an imputation of guilt, although the testimony may be perfectly true, and the accused entirely innocent.

In addition to the fact, that all the testimony of the knights themselves was given during imprisonment, under threats, and frequently during the operation of tortures, a fact which alone is sufficient to deprive such testimony of the smallest title to credit—in addition to the circumstance of many of the knights retracting the avowals of guilt thus obtained, which ought to have thrown discredit on the confessions of the rest; the conclusive proof against these confessions is the internal evidence of falsity which they contain. It would be tedious to repeat the variety of contradictory fictions which they display, to follow them step by step through their mazes of iniquity and fraud. The disgusting recitals bear on their front the stamp of falsehood. Let one instance suffice. Geoffrey de Gonavella being examined before the English commissioners, said, he was admitted into the order at the Temple in London, by Robert de Torvile, grand-master of England; that he was directed to deny Christ, but that he scrupled to do so, upon which the grand-master desired him to obey, and assured him that it would not be hurtful to his soul, at the same time telling him that the custom had been introduced by a *wicked* master, who, being confined in a Saracenic dungeon, and having no other means of escape, swore that he would introduce that custom into the order, which had always thenceforward been observed. "Therefore," said the superior, "you may well do this thing." Is it credible that de Torvile would have made use of the term *wicked* at the very moment he was directing the novice to perform the act, for the introduction of which that term was applied? The strong contradictions in matter of fact which distinguish the examinations, and which are collected by M. Raynouard, are not more conclusive against their truth, than the manifest violations of reason and probability in which they abound.

The last proof of the innocence of the Templars is found in the bull, which pronounced the dissolution of the order. The pontiff there acknowledges that the evidence of their guilt was not conclusive. Now, if the testimony of the witnesses against the order, or even one tenth part of that testimony, was to be credited, no one could for a single moment doubt the truth of the accusations against them. So entirely indeed does Clement appear to have been convinced that the charges were not substantiated, that he feared to trust the case to the decision of a general council; but, assembling the cardinals and certain prelates in a secret consistory, he there, of his own authority, abolished the order. He was not however bold enough to pronounce a definitive decree, but, pursuing those half-measures of iniquity, which prove how easily the darkest depravity may be united with the most pusillanimous meanness, he pronounced the sentence by way of provision, rather than condemnation; a decision equally contrary to justice and to ecclesiastical rules.

KNITTING. It is probable that the art of knitting was discovered in the sixteenth century, but this is doubtful; and it is a disputed point to what people we are indebted for the invention, the name of the inventor being wholly unknown. Savary, in the "*Dictionaire de Commerce*," gives the merit to the Scottish nation, because the French stocking-knitters, when they became so numerous as to form a guild, made choice of St Fiacre for a patron, this saint having been the son of Eugenius, who is said to have been king of Scotland in the beginning of the seventh century; besides this, there is a tradition that the first knit stockings were carried to France from that country. The first letter of foundation for this guild, named the "*Communauté des maitres bonnetiers au tricot*," is dated August 1527. This account of the invention is however contradicted by our own annals. Howel, in his "History of the World," printed in 1680, relates that Henry VIII., who reigned from 1509 to 1547, wore *cloth hose*, till he received a pair of knit silk stockings from Spain. This author says, "Silk is now grown nigh as common as wool, and become the clothing of those in the kitchen as well as the court; we wear it not only on our backs, but of late years on our legs and feet, and tread on that which formerly was of the same value with gold itself. Yet that magnificent and expensive prince, Henry VIII., wore ordinarily cloth hose, except there came from Spain, by great chance, a pair of silk stockings. King Edward, his son, was presented with a pair of long Spanish silk stockings by Thomas Gresham, his merchant, and the present was taken much notice of. Queen Elizabeth, in the third year of her reign, was presented by Mrs Montague, her silkwoman, with a pair of black knit silk stockings, and thenceforth she never wore cloth any more." In the year 1530, John Palsgrave, French master to the princess Mary, published a grammar, in which the different meanings of the verb *to knit* are exemplified, and among them "I knit bonnets or hosen," is rendered "*Je lasse;*"—Example. "She that sytteth knyttinge from morrow to eve can scantly win her bread." "Celle qui ne fait que lasser depuis matin jusqu'au soyre, a grans peyne peut elle gagner son payn." We give this sentence, because it seems to prove that knitting was a business at this time, although one which was badly remunerated; and the master's care to instruct his pupil in this meaning of the word, shows that knitting was an amusement or employment with which even royalty was acquainted. In a household book kept during the life of Sir Thomas L'Estrange of Hunstanton in Norfolk, by his lady, Ann, daughter of lord Vaux, are entries, in the year 1533, for "knytt hose," at so low a price that we cannot suppose them to have been foreign articles, but made by those persons to whom Palsgrave's example refers. Neither can we imagine these hose were of silk, two pair of them, at the price of one shilling together, being for the children. And in the reign of Edward VI., among the regulations relating to trade and manufactures, issued in 1552, mention is made of "knitte hose, knitte petticotes, knitte gloves, knitte slieves, or any other thing used to be made of woolle." The art of knitting must have been practised to some extent to render this act necessary, and we cannot reconcile it with other anecdotes upon the subject: as for instance, we are told, that, in the year 1564, William Rider, an apprentice of Mr Thomas Burdett, having accidentally seen in the shop of an Italian merchant, a pair of knit worsted stockings, procured from Mantua, and having borrowed them, made a pair exactly like them, and these were the first stockings knit in England of woollen yarn. Either this anecdote or the act of Edward VI. must be incorrect, and we think the balance of credibility is in favour of the latter. About 1577, knitting was so commonly practised in the villages of England, that in Hollinshed's Chronicle, the bark of the alder is mentioned as being much used by the country wives in colouring their "knitt hosen" black. The greatest ornaments in dress about the same time, were knit silk stockings and Spanish leather shoes. About 1579, queen Elizabeth being at Norwich, there were exhibited before her upon a stage, eight female children spinning worsted yarn, and as many knitting worsted yarn hose. We ought to notice, that the court poet of Henry VII. mentions in derision the "blanket hose" of the female who is the subject of his verse; thereby intimating that even at that period better kinds of stockings were in use. To counterbalance this, we have the expression *cloth hose* as worn by queen Elizabeth, who inherited among others of her father's many foibles (to speak gently) his love of dress.

In Germany the first mention of stocking-knitters occurs in the middle of the sixteenth century, and at Berlin about the year 1590. Silk stockings were first worn in France by Henry II., at the marriage of his sister with the duke of Savoy in 1559. In the reign of Henry III., who ascended the throne in 1575, the consort of Geoffry Camus de Butcarre, who held a high office in the state, would not wear silk stockings, given to her by a nurse who lived at court as a Christmas present, because she considered them to be too gay. This was forty-eight years after the establishment of the guild in that country.

The first stocking-loom used in England was invented by William Lee, and the date of this invention is fixed in Deering's history of Nottingham, in the year 1589. This ingenious person was a native of Woodborough, a village about seven miles distant from Nottingham. He was heir to a considerable freehold estate, and a graduate of St John's college, Cambridge. Being attached to a young country girl, whose occupation was knitting, he bethought him of endeavouring to find out a machine which should facilitate her work, and lessen her labour. The result of his efforts was the stocking-loom; and having instructed his brother James in the use of it, and engaged apprentices and assistants, he carried on business for several years at Calverton, a village about five miles distant from Nottingham. Obtaining neither support nor remuneration from queen Elizabeth, to whom he showed his work, Lee accepted an invitation from Henry IV. of France, who, having heard of this invention, promised a handsome reward to the author of it. Lee, therefore, carried nine journeymen and several looms to Rouen, in Normandy, where he worked with great approbation; but the assassination of the king, and the internal commotions which succeeded, injured the undertaking, and he fell into great distress, and died soon after at Paris. Two of his people remained in France; the others soon returned to England, and joined a former apprentice of Lee's, named Aston, at Thoroton, by whom some improvements in the loom were made, and the foundation of the stocking manufactory laid in this country. The number of masters increased so much, that they applied to Cromwell to sanction the formation of a guild: this was however refused, and letters patent were not granted to them till 1663, when privileges were secured to them to the extent of ten miles round London.

In the year 1614, the Venetian ambassador, Antonio Correr, persuaded an apprentice named Henry Mead, by the promise of five hundred pounds sterling, to go with a loom to Venice for a stated time, and to teach there the use of it. Mead met with a favourable reception; but his loom becoming deranged, and no person at Venice being able to repair it, he returned to England when his time was expired, and the damaged loom was sold in London by the Venetians for a mere trifle. Another account says that Correr sent a boy back with Mead to England, who returned to Venice well instructed in the art, which was established at Udina, and a great many stockings manufactured and sent for sale chiefly to Gradisca, in Austria. But in consequence of the poverty of the Venetian stocking-knitters, an order was given to the person who had made the machines, Giambattista Carli of Gemona, that he should make no more looms; and the business at Udina being relinquished, the masters removed their machines to Gradisca, where the inhabitants of Udina were obliged to purchase such stockings as they wanted.

Some years after this, a person of the name of Abraham Jones, who understood stocking-weaving and the construction of the loom, went with some assistants to Amsterdam, where he worked on his own account for two years, till he and his people were carried off by a contagious disease, when the looms (no one understanding the use of them) were sent to London and sold at a low price. This was mentioned in the petition to Cromwell, and the establishment of a privileged company urged as the means of exclusively retaining the trade in this country.

Notwithstanding the clear and distinct account of the invention of the stocking-frame by William Lee, the French have laid claim to that honour; as, however, they do not pretend to give the name of the inventor, or the circumstances attending his discovery, it is not worth while entering into their pretensions. The first loom was probably carried to France in the time of Colbert, by a person named Cavellier, a native of Nismes; and in the course of fifty years the number of looms in that town and neighbourhood increased to some thousands. Savary asserts that the stocking manufactory was established at the castle of Madrid, in the Bois de Boulogne, near Paris, in 1656, under the direction of John Hindret. Winkelmaun says that the French refugees who sought shelter in Germany after the revocation of the edict of Nantes, carried the first looms to Hesse. This is rendered probable by the circumstance that the Germans give French names to every part of their looms, as well as to their different kinds of work.*

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LAC; a resinous substance, found upon several trees and shrubs in the East Indies, and which is of considerable use in various arts and manufactures. It is produced by the lac insect (*chermes lacca*,) of which the following account is given by Dr Roxburgh in the Transactions of the Philosophical Society.—

"Some pieces of very fresh-looking lac, adhering to small branches of *Mimosa cinerea*, were brought to me from the mountains. I kept them carefully in wide-mouthed bottles slightly covered, and fourteen days from the time they came from the hills, thousands of exceedingly minute red animals were observed crawling about the lac and the branches it adhered to, and still more were issuing from small holes on the surface of the cells. By the assistance of glasses, small excrescences were also observed, interspersed among these holes, two regularly to each hole, crowned with some very fine white hairs, which being wiped off, two white spots appeared.

"The animals, when single, ran about pretty briskly, but in general, on opening the cells, they were so numerous, as to be crowded over one another. The substance of which the cells were formed cannot be better described, with respect to appearance, than by saying it is like the transparent amber of which beads are made. The external covering of the cells is about the twenty-fourth part of an inch in thickness, it is remarkably strong, and able to resist injuries; the partitions are much thinner. The cells are, in general, irregular squares, pentagons and hexagons, about an eighth of an inch in diameter, and a quarter of an inch deep; they have no communication with each other. All those opened during the time the animals were issuing from them, contained in one side, which occupied half the cell, a small bag filled with a thick jelly-like red liquor, replete with what I take to be eggs. These bags adhere to the bottom of the cells, and have each two necks, which pass through holes in the outward coat of the cells, forming the excrescences we have mentioned, ending in some fine white hairs. The other half of the cells have a distinct opening, and contain a white substance, like a few filaments of cotton rolled together, and a number of the little red insects themselves, crawling about, ready to make their exit. Their portion of each cell is about one half, and I think must have contained nearly one hundred of these animals. In other cells less forward, I found a thick, red, dark, blood-coloured liquor, with numbers of exceedingly minute eggs, many times smaller than those found in the small bags which occupied the other half of the cells."

These animals undergo several changes in the course of their existence; from the egg proceeds the *larva;* its next change is into the *pupa*, from which, at length, the perfect insect issues.

As an article of commerce, lac is known in Europe under the names of *stick-lac*, *seed-lac*, and *shell-lac*. The first is the lac in its native state, as it is found adhering to the twigs on which it was originally deposited. The seed-lac is the yellowish hard resinous powder, which remains after the red colour of stick-lac has been extracted, as far as it can conveniently be done, by water. Shell-lac is produced from seed-lac, by putting the latter into long cylindrical bags of cotton cloth, melting it by holding the bags over a charcoal fire: and when the lac melts, straining it through the cloth by twisting the bags. The lac thus strained is allowed to fall upon the smooth plank of a plantain-tree, and is there spread into thin plates; in this form it is brought to Europe, and is employed in the manufacture of sealing-wax and varnishes. It forms the basis of the well-known French polish, and is used by hatters in the making of waterproof hats.

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* Magazine of Domestic Economy.

The colouring matter which the stick-lac contains, is employed in dyeing; and the deeper the colour of the sample, the better it is for that purpose. The colour which it affords, is less brilliant than the scarlet obtained from cochineal; but it has the advantage of possessing greater durability. It is said, that it may be employed to good purpose, by mixing a certain quantity with the cochineal, when, if it is not in too large a proportion, the scarlet will be rendered more permanent, without losing any thing of its beauty. The lac-colour is preserved by the natives, upon flakes of cotton-wool dipped repeatedly into a strong solution of the lac-insect in water, and then dried. Dr Bancroft endeavoured, by certain processes, to improve the brilliancy of the colouring-matter of the lac, and he so far succeeded, as to dye several small pieces of cloth of a brilliant scarlet, equal to that produced by cochineal; but when the experiment was tried on a larger scale, from some ill-understood cause, it was unsuccessful.

A very singular use is made of this substance in India; namely, forming it into grindstones, by the following plan: "Take of river-sand three parts, of seed-lac washed one part, mix them over a fire, and form the mass into the shape of a grindstone, having a square hole in the centre; cement it to an axis with melted lac, heat the stone moderately; and while revolving rapidly on its axis, it can be easily formed into a circle." Polishing grindstones are only made of such sand as will pass easily through fine muslin, in the proportion of two parts sand to one of lac. Some persons, instead of sand, use the powder of a very hard kind of granite. These grindstones cut very fast. The same composition is formed upon sticks for cutting stones, shells, &c., by the hand.

In 1837, the quantity of lac imported, re-exported, and consumed at home, was as follows:

Imported.		Re-exported.		Consumption.	
Lac-dye.	*Shellac.*	*Lac-dye.*	*Shellac.*	*Lac-dye.*	*Shellac.*
1,011,674	2,217,679	133,959	574,391	423,335	574,273

In 1832, the specific duty on lac was fixed at 6s. per hundred-weight. The price of fine lac is from 3s. to 4s. per pound, and of shellac from £6 to £7 per hundred-weight.

LAHORE; an extensive province in the northern part of Hindostan, lying between the 30th and 34th degree of north latitude. It is bounded on the north by Cashmere, on the south by Delhi, Moultan, and Ajmeer, on the east by the mountains of Hindostan, and on the west by the Indus. It is about 340 miles in length, and 200 in breadth. It is divided into two districts, called the Punjab and the Kohistan of Lahore. The Punjab is the flat country to the south-west, and is so called from the five celebrated rivers by which it is intersected; the Kohistan is the mountainous tract to the north-east. The population of Lahore is estimated by some at about 20,000,000. These consist of Sikhs or Singhs, Jauts, Rajpoots, Hindoos of lower castes, and Mahommedans. In the Punjab one-third of the inhabitants are Singhs or Sikhs. On the north-western borders the inhabitants are chiefly Afghans. The Punjab is the most fertile portion of Lahore. In it wheat, barley, rice, pulse, sugar and tobacco are cultivated. In some of the districts near the Indus, the manufacture of silk goods is extensively carried on, and large quantities annually exported to Cabul and Candahar. White cotton goods, indigo, sugar, and rice are exported to the countries west of the Indus and to Cashmere, in return for which shawls, various kinds of cloths, and fruits are imported. Horses and camels are exported to the south, in return for which the merchants bring back metals, spices, and European manufactured goods.

The Sikhs are a sect sprung from Nanak, a native of Lahore, who flourished in the fifteenth century. Sikh means in Sanscrit *disciple*. Nanak left two sons, from whom are descended 1400 families, called Shahzadehs, who are much venerated. The Sikhs have gradually increased in strength. Gooro Govind, who died near the beginning of the last century, new-modelled their government, and trained them into a band of ferocious soldiers, changing their name from Sikh to Singh, signifying a lion. In 1762 and 1763, the Sikhs were almost exterminated by the Afghans, but their undaunted resolution enabled them to overcome their misfortunes, and they at last succeeded in acquiring and consolidating their present territories. Up to the beginning of the present century, Lahore was divided into a number of petty principalities, who were continually at war with each other. Runjeet Singh, an ambitious chief, amalgamated these into one kingdom, and brought the whole under his authority. His commander in chief was a Frenchman, General Allard, one of the officers of the old imperial army of Napoleon. General Allard was formerly attached to the staff of marshal Brune. He quitted France at the downfall of Napoleon, with the intention of going to the United States of America, and had already paid for his passage on board one of the frigates of the Union, when he met with an Italian officer, who, like himself, was about to seek his fortune in a foreign clime, and was induced by the Italian to give up his American trip, and go into Egypt. He did so; and met with but a cold reception from the Pacha, and no employment. He then went into Persia, and at Ispahan he was heartily welcomed by the Abbas-Mirza, who conferred upon him the title of colonel, and treated him as such: he promised him the command of a regiment, but failed in his promise. Fortunately for Allard there was at the court of Ispahan an old king of Cabul, whose brother had usurped his throne and deprived him of his sight; this king, an experienced old man, told Allard that in Cabul he would be sure of welcome and employment. Cabul is situated between Persia and the principality of Cachmere. Allard went there, and found in fact that there was a king who could well appreciate the services of an European officer. But scarcely was Allard established in Cabul, when he learnt that there dwelt, two hundred leagues further on, a skilful and bold chief, who was employing all his energies and resources in founding a kingdom. This was the kind of chief that Allard desired to serve: he went therefore to Lahore, and found Runjeet Singh, who was then a rajah. Allard met with welcome and employment from the rajah, whose confidence he soon obtained: he placed under Allard a few men, who, being disciplined according to the military system of France, became the nucleus of the rajah's future army. Next, Allard disciplined a hundred men, who were thus instructed in the duties of military officers. Then he organized a regiment; then a brigade; then a division; his reputation increasing with the number of his soldiers, and the confidence of the rajah keeping pace with the growth of his army. This army soon became the terror of the neighbouring princes, who disputed with Runjeet Singh the sovereignty of the kingdom of Lahore: they were all in succession besieged in their fortresses, attacked in their retreats, beaten in open field, or vanquished in the defiles and fastnesses of their mountains. At length none resisted; and at the end of a few years Runjeet Singh was the only king of this country. It was the triumph of discipline over the rude warfare of the barbarian, and Allard was loaded with honours and with wealth: he had a palace at Lahore, a crowd of servants and slaves, and a regiment for his escort. He married a princess, a relation of the king, and was finally named commander-in-chief of the armies of the kingdom: he became, next to Runjeet Singh, the most important, powerful, and absolute personage in this extensive country.

On the 27th of June, 1839, Runjeet Singh died, at Lahore, the capital of the province, in his sixtieth year. The career of this extraordinary chieftain developed the character of a man born to change, or materially influence, the destinies of a vast portion of mankind. Proud, restless, ungovernable, impatient of restraint, he ruled with despotism over twenty millions of people; and from a licentious love of power, and unbounded ambition, aided by the fertile powers of his mighty genius, he rose from a common thief to be a conqueror of princes. Possessed of a considerable and well-disciplined army, numerous founderies and arsenals, a regular government, and a wealthy exchequer, he became the friend and ally of the British government in India. Runjeet Singh is represented as having had no education in any branch of learning or science. He could not read or write in any language; he did not value knowledge for its own sake, but he had the sense and discretion to appreciate, and apply for his own advantage, that of others. He was in the habit of hearing papers read in Persian, Punjabee, and Hindoo. He was the chief administrator of justice in his kingdom; and was easily accessible to any of his subjects. He displayed perspicuity in his appreciation of character; and the power of tracing the motives of others' actions, gave him a command and influence over all who approached him. His observations and remarks were given ordinarily in short, terse, incoherent phrases, or in the shape of interrogatories. He had great power of dissimulation; and, under the utmost frankness of manner and even familiarity of intercourse, could veil subtle designs and treachery. In action he was personally brave and collected; but his plans displayed no boldness or adventurous hazard. His fertility in expedients was wonderful. His uniform career and conduct through life prove him to have been selfish, sensual, and licentious in the extreme, regardless of all ties of affection, blood, or friendship, in the pursuit of ambition or pleasure. He plundered and reduced to misery, without the slightest feeling of remorse, widows, orphans, and families; but he was not blood-thirsty, for he has never taken life, even under circumstances of great aggravation. Indeed, his laws prohibit the punishment of death. A criminal sometimes had his nose or his ears cut off, but never his head. It was also not uncommon to cut off the hands of criminals; but in serious cases, and where the culprit had again committed the crime for which he had been once already punished, the tendon Achilles was cut through. With the aid of his confidential officer, general Allard, he brought his army into the finest state of skill and subordination; but his troops still wear the turban. He was attached to the chase; and had an ardent passion for precious stones and fine horses, to procure which he has often undertaken a disproportionate military expedition. His jewels are said to be the richest and finest in the world; and the riches and magnificence of his court and palace, the splendour of his travelling equipage, and of all his equipments, exceeded all that we hear of among oriental princes. His stature was low, and the loss of his left eye from the small-pox took away from his appearance, which, however, was still far from being unprepossessing, for his countenance was full of expression and animation, and set off with a handsome flowing beard, gray, at fifty years of age, and tapering to a point below his breast. He was latterly so emaciated and weak as to be compelled to adopt a singular method of mounting the tall horses on which he loved to ride; a man knelt down before him and he threw his leg over his neck, when the man rose with the Maha Rajah mounted on his shoulders. He then approached the horse, and Runjeet Singh putting his right foot in the stirrup, and holding by the mane, threw his left leg over the man's head and the back of the horse into the stirrup on the other side. A portrait of the Maha Rajah is given in Mr Princep's work on the Origin of the Sikh Power, &c.

Four princesses, his wives, and seven slave girls, were permitted to burn themselves on his funeral pyre. The description of Arvalan's funeral (in Southey's *Curse of Kehama*), the burning of his two queens, and the train of female slaves, becomes, with a very trifling adaptation, the historical record of the real obsequies of the late monarch of Lahore. On the 2d of July his ashes were removed towards the sacred Ganges, at Hurdwar. The procession left the palace at about an hour after sunrise, and moved through the city of Lahore in the following order. One squadron of Sikh lancers, one by one, on account of the narrowness of the streets, followed by five gold cloth flags carried on foot; a golden khassah or palkee, containing the ashes of the Maha Rajah; the premier, Rajah Dehan Singh, on foot to the left, bearing a peacock feather chowry, and driving away the flies; and on the right Jamahadar Khoossial Singh, also on foot, bearing a golden punkah; on the left was the Maha Rajah's principal chutry bearer, carrying a golden chutry, and immediately behind came his personal servants, such as dressers, chowry, walla, cup bearer, &c. A little behind came four khassahs, containing the ashes of the four ranees burnt with him, followed by a fifth, containing the ashes of the seven slaves also burnt with him, and immediately behind marched his favourite horses, covered with gold; about fifty paces behind them came the heir to the throne, Kurruck Singh, on an elephant, dressed in plain white muslin, followed at a short distance by the whole court in the same dress without any kind of arms, and mounted on elephants. On arriving at the Delhi gate, the procession received a salute of eleven cartridges per gun from captain Ford's, Elli Bukh's, Emamsha's, and Sooltan Mamood's artillery (amounting to about twenty six pieces), and proceeded through a street, formed of a squadron of the body guard, captain Ford's, and Mr Steinbach's two battalions of infantry, at a slow pace; and receiving the salute of those two regiments, turned towards Hamb (a favourite barrah durry of the Maha Rajah about six miles from Lahore,) being the first march.

A few days before the Maha Rajah died, he gave away to fuckeers, gold and silver howdahs, elephants, horses, saddles, and bridles of the most costly articles covered with jewels and precious stones of all kinds and descriptions, gold and silver plates, precious stones, shawls, cows, buffaloes, hard cash, in gold and silver, &c. amounting, people say, to a crore of rupees. The Maha Rajah, from the day of his illness to that of his death, must have given away to fuckeers, brahmins, &c. nearly three crores of rupees, including what he sent to Gaya Gaya and Juggernaut. Runjeet Singh left the celebrated diamond, called the "*Khah-i-noor*," or *Mountain of Light*, which has so long been coveted by all the princes of India, as a legacy to be worn by the chief idol of Juggernaut.

LAING, William, an eminent bibliographer, was born at Edinburgh, 20th of July, 1764, and at the usual age was sent to the grammar High school of Canongate. Having fixed on the profession of a printer, he served an apprenticeship for six years, but abandoned this employment, as his eyesight was somewhat delicate; and a favourable opportunity presenting itself, he commenced business on his own account, as a bookseller in the Canongate, in 1785. A few years afterwards he removed from his first situation lower down the street to Chessel's Buildings, where he remained till 1803, when he removed to the South Bridge; having, from the year 1786, continued to issue an almost annual succession of catalogues. Modest and unassuming in his manners, and in the general tone of his temper, Mr Laing's knowledge in his profession was uncommonly accurate and extensive. Few surpassed him in an acquaintance with the history of particular editions of the works of the celebrated authors of antiquity. He knew which were scarce, and was well informed of the price that was put upon them, not merely in this country, but likewise on the continent. At a very critical period, in 1793, he first visited Paris, with the design chiefly of extending his knowledge of that particular department of business, in which he had now become eminent; for when any scarce or valuable work was wanted, his shop was known as the place where it was most likely to be found. After the peace of Amiens, and on several successive occasions, he visited France and Holland for a similar purpose. At a still earlier period, being informed that his majesty Christian VII. king of Denmark, had been advised to dispose of the numerous duplicates which were in the royal library at Copenhagen, he resolved to undertake a voyage to Denmark. This he accordingly did in 1799, chiefly at the instigation of Niebuhr, the distinguished investigator of Roman History, who was then a student in the university of Edinburgh. After remaining some time at Copenhagen, he concluded an arrangement with the right hon. privy councillor Dr Moldenhawer, the king's librarian, which proved satisfactory to both parties. During the war, when there was hardly any communication with the continent, Mr Laing commenced the publication of the Greek Historians. Nothing of the kind had ever been attempted in Edinburgh, or even in Scotland, excepting by the Foulis', the celebrated printers at Glasgow. In 1804, he published, in six volumes small 8vo., the works of Thucydides in Greek, accompanied with a Latin translation. Its title is, "Thucydides Græce et Latine. Accedunt Indices, ex Editione Wassii et Dukeri." In 1806 appeared in small 8vo., in seven volumes,—"Herodotus Græce et Latine. Accedunt Annotationes selectæ, necnon Index Latinus, ex Editionibus Wesselingii et Reizii." Xenophon was next published—"Xenophontis quæ exstant Opera, Græce et Latine, ex Editionibus Schneideri et Zeunii. Accedit Index Latinus." This appeared in 1811, in ten volumes, of the same size and type with the editions of Thucydides and Herodotus. Much of Mr Laing's time was latterly devoted to the Commercial Bank of Scotland; an institution which has proved of essential benefit to mercantile business in that country, of which he had been one of the original promoters, and for some years one of the ordinary directors. He died on the 10th April, 1832, leaving a widow and family.

LAMARCK, (*a.*) The chevalier de Lamarck died on the 18th Dec. 1829, in the eighty-fifth year of his age. The work on which Lamarck's fame is principally founded, and which has conferred a most important service on zoology, is his *Histoire Naturelle des Animaux sans Vertébres.* From the time of its appearance, this work has ever been regarded as one of the highest authority, and has formed the principal regulator of most departments of this extensive race of animals. The work extends to seven octavo volumes, and is entitled "Natural History of invertebrate Animals, presenting the general and particular Characters of these Animals, their Distribution, Classes, Families, Genera, and the principal Species referable thereto." The first volume is entirely occupied with an introduction, the object of which is to determine the essential characters of an animal, its distinction from vegetables and other natural bodies, and to explain the fundamental principles of zoology. This introduction may be regarded as furnishing a synoptical view of all the author's peculiar opinions on the origin and development of living beings, which are illustrated more in detail in separate works. The first five volumes are written entirely by Lamarck, but he was assisted in the part relating to insects by M. Latreille. A portion of the sixth volume and the whole of the seventh, were drawn up by his daughter from his notes and papers, his want of sight preventing him from undertaking that labour himself; and that part of the sixth, which relates to the *mytilacés*, *malliacés*, *pectinides*, and *ostracés*, is written by M. Valenciennes. The first part was published in 1815, and the other parts appeared at intervals up to 1822, when the whole was completed. Besides a luminous and comprehensive account of the general history of the different groups and genera, the principal species are cited and briefly characterized, with their synonymes, reference to figures, and localities. The enumeration of species sometimes includes all the known kinds, and is particularly copious and instructive in relation to sponges and shell-bearing molluscæ. The genera are established with much discrimination, and judiciously characterized by obvious properties, such as form, proportion, nature of the surface, and structure. The synonymy is unravelled with great care, and the descriptions, though necessarily often very brief, are in general highly satisfactory. These circumstances have rendered this work the most valuable system that has ever appeared of the invertebrate animals; and it has formed the guide to most authors who have since written on the subject.*

The phrase *invertebrate animals* originated with Lamarck, and it expresses, as Cuvier remarks, perhaps the only circumstances in their organization which is common to them all. They were previously known as *white-blooded animals*, a designation which was soon shown to be improper, by the discovery that an entire class (the *annelides*) possesses red blood. The system of Linnæus and Bruguière formed the basis of his course when he first began to lecture on the subject; he subsequently adopted a new classification, founded on their anatomy, which had been published in 1795. This he afterwards modified in various ways, as new discoveries were made, and as new relations suggested themselves to him. In his system of invertebrata, forming an octavo volume, published in 1810, he adopted the class of *crustacea*, and created that of *arachnides*, a step which he judged necessary, in consequence of some new information that been communicated to him on the heart and pulmonary sacs of spiders. In a previous work he had admitted the *annelides* to the rank of a separate class, in consequence of Baron Cuvier's observations on their circulating organs and the colour of their blood, which resembles that of the vertebrate races. Two other classes were created, in his "Philosophical Zoology," viz. the *infusoria* and the *centripedes;* and in this work also he first deviated from the ordinary practice of commencing the arrangement with the most perfectly organized, the inverse order being more in accordance with his theoretical views, which assumed a gradual *progression* in the composition of animal organs, proceeding from the most simple to the most complex.

To the history of fossil shells, Lamarck communicated a remarkable impulse. This highly important and interesting subject had long attracted the attention of geologists, but owing to the difficulties with which it is invested, it still remained in comparative obscurity. One of the facts most desirable to be ascertained in relation to these remains, was, whether they were identical with species now living, a point which could be determined only by a careful comparison. Applying to this investigation that profound knowledge which he had acquired of recent shells, Lamarck was enabled to illustrate the subject in a most satisfactory manner, and to throw light on some of the most anomalous phenomena which it presents to the inquirer. Besides his extensive acquaintance with the *testacea*, he enjoyed another advantage for entering upon an inquiry of this nature by residing at Paris, the vicinity of which has long been celebrated for the number and variety of its fossil productions.† The result of his investigation appeared in several of the earlier volumes of the Annals of the Museum; but the memoir was never brought to a conclusion. It was accompanied with a quarto volume of plates, containing figures of great beauty and accuracy.

Such are the principal subjects to which Lamarck's attention was directed, together with some of the results to which his investigations led him. After his establishment in the Museum of Natural History, much of his time was occupied with the objects whose history he was appointed to teach; and so favourably were his labours in this department received by the public, that his interest as well as his inclination would have conspired to make him cultivate it to the uttermost. But his exertions received an early check, and were at last entirely stopped by the inroads of a most afflicting calamity. His eyes had long been weak, and, as he advanced in years, they became so diseased, that he was obliged to refrain from using them for the examination of any minute object. Hence it was that he had recourse to the celebrated Latreille to assist him in that part of his system of invertebrata which related to insects. Notwithstanding every precaution, the disorder increased, and at last produced total blindness, which continued till his death. "This event was the more distressing," says Cuvier, "because it overtook him in such circumstances that he could obtain none of those means of alleviation which might otherwise have been procured. He had been married four times, and was the father of seven children. The whole of his little patrimony, and even the fruits of his early economy, were lost in one of those hazardous investments which shameless speculators so often hold out as baits to the credulous. His retired life, the consequence of his youthful habits, and attachment to systems so little in accordance with the ideas which prevailed in science, were not calculated to recommend him to those who had the power of dispensing favours. When numberless infirmities, brought on by old age, had increased his wants, nearly his whole means of support consisted of a small income derived from his chair. The friends of science, attracted by the high reputation which his botanical and zoological works had conferred on him, witnessed this with surprise. It appeared to them, that a government which protects the sciences, ought to have provided for the wants of a celebrated individual; but their esteem for him was doubled, when they saw the fortitude with which the illustrious old man bore up against the assaults both of fortune and of nature. They particularly admired the devotedness which he inspired in such of his children as remained with him. His eldest daughter, entirely devoted to the duties of filial affection for many years, never left him for an instant, readily engaged in every study which might supply his want of sight, wrote to his dictation a portion of his last works, and accompanied and supported him as long as he was able to take some exercise. Her sacrifices, indeed, were carried to a degree which it is impossible to express; when the father could no longer leave his room, the daughter never left the house. When she afterwards did so, for the first time, she was incommoded by the free air, the use of which had been so long unfamiliar to her. It is rare to see virtue carried to such a degree, and it is not less so to inspire it to that degree; and it is adding to the praise of M. de Lamarck, to recount what his children did for him."

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* The most recent and probably the best edition of the *Animaux sans Vertebres*, is in eight volumes octavo, augmented with notes by M. M. Deshayes and Milne Edwards.

† Cuvier conceives that the basin of Paris contains a greater accumulation of fossil shells than any other place of equal extent. At Grignon, no fewer than six hundred different species have been collected in a space not exceeding a few square toises.

LAMB, Charles; an essayist and critic, distinguished for subtilty of wit, delicacy of humour, and profound sympathy with every thing human, was born in Crown Office Row, Inner Temple, London, on the 18th Feb., 1775. His father was clerk to Mr Salt, one of the benchers of the Inner Temple, and Charles was the youngest of three children, John, Mary, and Charles. In the essays of Elia, John and Mary are described under the names of James and Bridget Elia, and they are otherwise veiled by the title of *cousins*, but the rest is all verity. His father is also celebrated under the name of Lovell, in the essay entitled, The Benchers of the Inner Temple. At the age of seven, Charles was entered at Christ's hospital, and remained a scholar of that establishment till he had reached his fifteenth year. Coleridge was among his school-fellows, and thus originated a friendship between the two which lasted with life. His own account of his school-days is admirably given in his paper, entitled, "Christ Hospital Five and Thirty Years ago." On the completion of the usual period allotted for education at that school, he was first employed for a short time in the South Sea House with his brother; but on the 5th of April, 1792, he obtained an appointment in the Accountant's office of the East India Company, and remained in the employments of these princely merchants till the 29th of March, 1825, by which time his salary had gradually risen to above £700 per annum, when he was allowed to invalid upon the handsome pension of £450, which he enjoyed till his death, on the 27th of Dec., 1834. He lived a bachelor with his sister in various dwellings, but for the greater part of his life in the Temple, which he preferred to all other places. Latterly, he sequestered himself in the suburbs of London, at Colebrook Row in Islington, at Enfield, and at Edmonton, where he died. His death was caused by erysipelas in the head, brought on by an accidental fall, in which his face had been slightly injured.

The life of Charles Lamb is unusually meagre in events, his publications forming almost the only epochs. His first appearance as an author was in a small volume of poems, published in 1797, in conjunction with his friends Coleridge and Lloyd. In the following year, the blank verse of Loyld and Lamb contained in this volume was republished in a thin duodecimo, under the title of "Blank Verse of Charles Lloyd and Charles Lamb." The volume obtained no notice, or was dismissed by reviewers with a sneer. "A Tale of Rosamond Gray and Old Blind Margaret," in prose, published the same year, was better received. This tale has been much praised for its sentiment and pathos, but we confess it is the only production of Charles Lamb's for which we have no liking. The plot, or rather the point upon which the story hangs, is revolting, and the sentiment is so overwrought as to appear affected. In 1802, he published "John Woodvil, a tragedy," along with "Fragments from Burton," a favourite author. "John Woodvil," written in imitation of the early English dramatists, was coldly received, and its peculiarities made the subject of merriment in the Edinburgh Review. "Mr H.," a farce, was Lamb's next production. It was performed at Drury Lane theatre in December, 1806, but without success. The story is that of a young gentleman, named Hogsflesh, who, afraid that his name might stand in the way of a certain lady accepting his hand, passes as *Mr H.* only, and encounters numberless difficulties in keeping his real name from her knowledge. At the altar, however, it is necessarily divulged, upon which the sentimental lady faints, but all is set to rights by Mr H. showing letters patent, empowering him to change his name from Mr Hogsflesh to Mr Bacon. In 1807, he published a series of stories founded on the plays of Shakspeare, in which the language of Shakspeare is preserved wherever possible, and the outline of the plot brought within the apprehension of children. In this work his sister Mary had a hand. The tales of King Lear, Macbeth, Timon of Athens, Romeo and Juliet, Hamlet, and Othello, are by Charles; the others by Mary Lamb. In conjunction with his sister, he also compiled two other popular books for children,—"Mrs Leicester's School," and "The Adventures of Ulysses." In 1808 appeared his "Specimens of English Dramatic Poets who lived about the time of Shakspeare, with Notes." This work slowly but gradually wrought its way into notice, and was highly instrumental in creating a relish for the early English dramatists. In 1810-11, he contributed to a quarterly magazine, edited by Leigh Hunt, entitled "The Reflector," a series of papers, including those on Hogarth's pictures and the tragedies of Shakspeare. In 1818, his poems and essays were collected and published in two little 12mo volumes, under the title of "The Works of Charles Lamb." This, he himself said, should have been called the Recreations rather,—his veritable *works* being to be found in the ledgers of the East India House. The most celebrated of Mr Lamb's writings appeared after the establishment of the London Magazine, in 1820, under the auspices of Mr John Scott, when he began to contribute to it, under the name of "Elia." Elia was the name of an old foreigner, a clerk in the South Sea House, in Lamb's young days, and it was adopted without any applicability to himself. The Essays of Elia in the London Magazine were subsequently collected and published. Later papers, published in the Englishman's Magazine, the Athenæum, &c. appeared shortly before his death, with the title of "The Last Essays of Elia." "Album Verses" published in 1830, and two dramatic sketches which appeared in Blackwood's Magazine about the same time, nearly complete the list of his writings. After his death a collection of his works was made by Mr Moxon, and published by him, the poems in one volume, the prose in three. "The Letters of Charles Lamb, with a sketch of his Life, by T. N. Talfourd," appeared in 1827, in 2 vols. 12mo.

The place which Lamb holds in English literature is altogether unique and peculiar; but the sphere of his excellence is limited. In the first place, he cannot be considered as a poet, in the higher sense of the term. His mind was too whimsical for sustained beauty, within the severe limitations of poetry. It was ever wandering into some fantastic train of thought; some out-of-the-way analogy, unfit for the serious muse. He had but little dramatic talent; his attempts in the theatrical way proved failures. Indeed, it is plain enough that to conceive and represent a character dramatically, requires a steadiness of intellect, a firmness of purpose, a power of changing places with imaginary personages, which never belonged to Charles Lamb. His imagination laid hold of oddities of character with wonderful readiness; and he described, not represented, them with truth and wit. But he did not, and could not, bring a consistent being before us, and exhibit it in all the varieties of action and passion. His play of "John Woodvil" has a few fine poetical passages, and some happy imitations of old English dramatists; but it shows no talent for the stage. In his own walk, however, he was unrivalled. The short, humorous essay he carried to a point of excellence never before attained. His style is ever happy and original; his wit, of the rarest and most pungent description. The native peculiarities of his mind appear, fresh, racy and delightful. The love of quaint conceits, which was a part of his nature, was increased by his enthusiastic study of the early English authors, who furnished his mind with its most genial sustenance; and his easy flow of expression and pithy language received a certain antique colouring from the same source. His wit, clothed in this curious garb, comes upon the mind with the most irresistible effect. We regard it as something singular, something remote from every thing else within our knowledge, and yet wholly free from affectation. His mind sympathised so completely with his favourite writers, that he became almost their contemporary, and poured out his rich drollery in their quaint expressions, with the same natural gush of imagination and whim, as they would have done themselves. It is not easy to say in what his wit mainly consists. Certainly it does not depend for its effect upon single brilliant sallies; upon pointed antithesis; upon repartee. It is rather a quality, a flavour, with which all his thoughts and images are impregnated. It is the concentrated fragrance of a thousand scattered perfumes. The senses are delighted with the united sweets, but the several ingredients escape the minutest analysis. If we say that his perception of the ludicrous is his strongest point, we speedily find ourselves in the wrong. Others have this power to a greater extent than he, without a millionth part of his wit. He is constantly punning; but that is not the secret. His wit is not the perception of ludicrous images; it is not a play upon words; it is not the sudden exhibition of unexpected relations; but it is something wholly inseparable from the texture of his mind, and his habits of association, and assuming all the outward forms, of which language is capable. It is a subtile spirit, pervading all his writings, and reaching the reader's mind by a thousand different avenues. We can neither seize it nor escape from it.

Turning from his literary character to his private life, we find it marked by as strong peculiarities as his writings. Though indifferent to the benevolent projects of the day, his affections for those about him were strong and tender. The amiable qualities of his heart endeared him to many, not only of different but of opposite characters. He had a strange facility in passing over the disagreeable things in his associates, and fastening only on those traits which pleased him. This was partly owing to his indifference to great principles of action, and his dislike of change and agitation. He was consequently surrounded by people, whose voices must have occasionally produced a strange discord, that all the gentleness of his nature could scarcely hush. "Lamb's indulgence," says Sergeant Talfourd, "to the failings of others could hardly be termed allowance—the name of charity is too cold to suit it. He did not merely love his friends in spite of their errors, but he loved them, errors and all, so near to him was every thing human." But the most pleasing trait in his private life, is the extraordinary love he bore his sister. She had taken care of his sickly infancy, and in return, he devoted the flower of his life to her comfort and happiness. He abstained from forming any other and closer ties, that he might bestow his undivided care upon the companion of his childhood. How well that high duty was performed, and how justly this beautiful part of his chequered character was appreciated by his friends, is feelingly shown in Serjeant Talfourd's volumes.

LAMB, Hon. George, under secretary of state for the home department, and M. P. for Dungarvon, brother to lord viscount Melbourne, was born July 11, 1784, being the fourth and youngest son of Penniston, first viscount Melbourne, by Elizabeth, daughter of Sir Ralph Milbanke, bart. He was educated at Eton, where, together with his brothers, he was under the immediate care of the late Rev. Dr Langford; and at Trinity College, Cambridge, where he was created M.A. in 1805, and passed through the usual course of university studies with greater success than, from his retired habits and unpretending character, was generally known. He was early entered of Lincoln's Inn, and called to the bar, after which he for a short time went the northern circuit; but he soon ceased to practise, partly on account of ill health, and devoted his attention principally to literature. His brother, the hon. Penniston Lamb, who died in 1805, had also been bred to the law, and left him an extensive library. Mr Lamb was one of the most active members of the committee of management of Drury Lane Theatre, when the earl of Essex, lord Byron, and the hon. Douglas Kinnaird, were his associates. He was himself the author of "Whistle for it," an operatic piece, 1807. He also published some minor poems; but his most elaborate and remarkable work, was a translation of Catullus. In the year 1819 he was put forward by the Whigs to contest the representation of Westminster against the Radicals, on the death of Sir Samuel Romilly. The contest lasted fifteen days, and terminated as follows:—

Hon. George Lamb, .	4465
Mr Hobhouse, . . .	3861
Major Cartwright, .	38

In 1826, he entered parliament, through the interest of the duke of Devonshire, as member for Dungarvon, and he had represented that borough in four parliaments at the time of his death. On the accession of the Grey ministry, he became under secretary of state to his brother lord Melbourne in the home department. His official duties were executed in an efficient manner, and his speeches in parliament were delivered in a sensible and intrepid style. In private society Mr Lamb was unreserved, communicative, and agreeable; his accomplishments were admitted by all who knew him; his kindness of heart and mildness of temper were proverbial. He married, May 17, 1809, Mademoiselle Caroline-Rosalie Adelaide St Jules, a relation of the duke of Devonshire, and with that estimable lady, of a character entirely assorting with his own, he enjoyed the truest domestic felicity. His death took place on the 2nd Jan. 1834.

LANCASTER, Joseph, the promulgator of the system of mutual instruction known by his name, was born in England in 1771, and bred a quaker. In 1798, he commenced schoolmaster, adopting the plan of instruction invented by Dr Bell at Madras, who in 1797, published a pamphlet on the subject, entitled "An Experiment in Education, made at the Male Asylum of Madras, suggesting a system by which a school or family may teach itself, under the superintendence of the master or parent." Joseph, however, always denied being indebted to Dr Bell for his system. He received great encouragement from many persons of the highest rank, which enabled him to travel over the kingdom, delivering lectures, giving instructions, and forming schools. Flattered by splendid patronage, and by unrealised promises of support, he was induced to embark in an extensive school establishment at Tooting, to which his own resources proving unequal, he was thrown upon the mercy of creditors. Concessions were, however, made to his merit, which not considering as sufficient, he abandoned his old establishment, and left England in disgust; and about the year 1820, went to America, where his fame procured him friends, and his industry rendered him useful. He died at New York, Oct. 24, 1838, in consequence of having been run over by a waggon the day before. The titles of his publications were as follow:—"Improvements in Education as it respects the industrious classes of the community, containing, among other important particulars, an account of the Institution for the Education of One Thousand Poor Children," 1803. "A Letter to the Right Hon. John Foster, on the best Means of Educating and Employing the Poor in Ireland," 1805; 8vo. "An Appeal for Justice, in the cause of Ten Thousand Poor Children, and for the Honour of the Holy Scriptures; being a Reply to the Visitation Charge of Charles Daubenny, Archdeacon of Sarum," 1807. "Outlines of a Plan for the Educating of Ten Thousand Poor Children, by establishing Schools in country towns and villages, and for uniting works of industry with useful knowledge," 1807; 8vo. "A Spelling Book for the use of Schools," 1808; 12mo. "Account of the Progress of J. Lancaster, from the year 1798," 1811; 8vo. "Substance of a Lecture delivered at the Freemasons' Tavern," 1812; 8vo

LANDON, Letitia Elizabeth, a highly gifted writer, known to all lovers of poetry by her initial signature of "L. E. L.," was the daughter of an army-agent, and was born and educated at Chelsea. The date of her birth we have not ascertained, and indeed we have to regret generally the extreme meagreness of our information regarding her personal history. She was the niece of Dr Landon, dean of Exeter, who died on the 29th of December, 1838, two months after her own most melancholy end. It is supposed that she has depicted the real history of her own childhood, in her volume called "Traits and Trials," 1837. On the 7th of June, 1838, she was married to George Maclean, Esq., governor of Cape-Coast Castle, South Africa, and was only just settled in her new residence there, when her death took place, on the 15th October, same year, under very afflicting circumstances. On the morning of that day, she was found dead in her own room, with an empty bottle in her hand, labelled "Acid Hydrocianicum Dilutum," (diluted prussic acid.) It is supposed that she had taken some of this medicine as a cure for spasms, to which she was subject, but had inadvertently or accidentally exceeded the proper quantity. Those friends who knew her best have no suspicion that she intentionally committed suicide. While they scout this idea, they readily admit that, from her peculiar temperament, she was one extremely likely to resort to a desperate remedy for the cure of any personal ailment. What removes further the suspicion of suicide is, that a letter was found on her desk, which she had written to a friend in Scotland, dated the morning of her death, in which she expresses herself as satisfied and pleased with Cape Coast and its inhabitants, and as finding every thing there much better than she had expected. On the day of her death an inquest was held on her body, at which Emily Bailey, her servant, deponed, that between the hours of eight and nine in the morning, having received a note addressed to Mrs Maclean, from Mr Swanzey, she went to her room for the purpose of delivering the same to her, and found some difficulty in opening the door, in consequence of Mrs Maclean having fallen against it; that deponent, on entering the room, discovered Mrs Maclean lying on the floor with an empty bottle in her hand, (which bottle being produced was labelled "Acid Hydrocianicum Dilutum, Pharm. Lond. 1836,") and quite senseless. Mr Maclean stated, she was very subject to spasms and hysterical affections, and had been in the custom of using the medicine contained in the small bottle produced, as a remedy or prevention, which she told him had been prescribed for her by her medical attendant in London. Mr Cobbold, the surgeon in attendance, gave his opinion "that death was caused by the improper use of the medicine. The body after death was perfectly natural; he imagined that Mrs Maclean, not having received the usual benefit from the prescribed quantity, was induced to exceed it, or that the spasms may have come on when she was in the act of taking the medicine, and thus involuntarily a greater quantity may have been swallowed. He had no hesitation in ascribing her death to this cause; ten drops would be sufficient to cause death in ten or fifteen minutes, to a person not in the habit of using it; was so fully convinced that the medicine was the cause of her death, that he did not think it necessary to open the body." The jury returned a verdict that death was caused "by her having incautiously taken an over-dose of prussic acid, which, from evidence, it appeared she had been in the habit of using as a remedy for spasmodic affections, to which she was subject."

The fate of "L. E. L." excited a very general sympathy throughout the country. To talents of a high order, she had other claims to admiration, in personal charms of no ordinary attraction, and in a disposition the most generous and affectionate. "Brilliant as was her genius," says one of her friends, "her heart was after all the noblest and truest gift that nature in its lavishness had bestowed upon her,—upon her who paid back the debt which she owed for these glorious endowments of heart and mind, by an indefatigable exercise of her powers for the delight of the public, and by sympathies the most generous and sincere with human virtue and human suffering. More perfect kindness and exquisite susceptibility than hers was never supplied as a graceful and fitting accompaniment to genius, or elevated the character of woman."

The following sketch of Miss Landon's literary career is given in the Athenæum. "The early loss of her father, and the early manifestation of a talent facile as it was fanciful, brought her before the world while yet a girl, as an enthusiastic and constant literary labourer. To her honour, it must be added, that the fruits of her incessant exertion were neither selfishly hoarded nor foolishly trifled away—but applied to the maintenance and advancement of her family. It might be partly the early consciousness of this power to befriend others, and partly the indiscriminate flatteries of those by whom she was surrounded and pushed forward at her first entrance into authorship, which encouraged her to such ceaseless composition as necessarily precluded the thought and cultivation essential to the production of poetry of the highest order. Hence, with all their fancy and feeling, her principal works — the 'Improvisatrice,' the 'Troubadour,' the 'Golden Violet,' the 'Golden Bracelet,' and the 'Vow of the Peacock,'—bear a strong family likeness to each other in their recurrence to the same sources of allusion, and the same veins of imagery,—in the conventional rather than natural colouring of their descriptions, and in the excessive though not unmusical carelessness of their versification. It should be remarked, however, that in spite of the ceaseless strain upon her powers, and the ceaseless distractions of a London life, Miss Landon accomplished much for her own mind in the progress of its career; that she had reached a deeper earnestness of thought—had added largely to the stores of her knowledge, and done much towards the polishing and perfecting of her verse. Besides her poetry, Miss Landon's three novels—'Romance and Reality,' 'Francesca Carrara,' and 'Ethel Churchill,' remain to attest her powers as a prose writer. They are all of them stories of sentiment: the two latter relieved by glimpses of such gay and courtly life, as Watteau loved to paint, and Walpole and Lady Mary Wortley Montague to embalm in their correspondence. In right of this spirit, they in some degree reflect the conversation of their authoress, which sparkled always brightly with quick fancy, and a *badinage* astonishing to those matter-of-fact persons who expected to find, in the manners and discourse of the poetess, traces of the weary heart, the broken lute, and the disconsolate willow tree, which were so frequently her themes of song. Another novel was in progress at the time she was snatched away with such awful suddenness, it having been her purpose to maintain her literary relations with England, and her hope to produce yet better and fresher works. Had her life been spared, this hope would, we think, have been fulfilled. As it is, the public will recollect pleasantly what she has achieved, and feel the void caused by the withdrawal of her graceful and versatile fancy. Her private friends and her literary contemporaries, too, will remember her long, as one alike kind, affectionate, and liberal." To this estimate of Miss Landon's talents and performances, we may add, that her first productions were brought forward about the year 1822, in the pages of the Literary Gazette, to which she was mainly indebted for her reputation, and to which she continued for many years a frequent contributor. It is well known how largely she has contributed to many other periodicals, and to nearly all the Annuals, of some of which she wrote all the poetry, as Fisher's drawing-Room Scrap book (eight quarto volumes), the Flowers of Loveliness, and the Bijou Almanac.

LANDSCAPE-GARDENING, (*a.* to the article *Gardening.*) The old English pleasure-garden, as it was called, was constructed on the principle of making nature conform to art, not art to nature. Shrubs and trees were cut into fantastic shapes, walks were measured and squared with mathematical precision, terraces were raised in opposition to valleys, and canals were dug in place of meandering streams. The modern or natural style of gardening was first advocated by Pope and Addison, and more recently by Mason and Walpole; but Milton, in his description of Paradise, seems to have anticipated all English authors on this subject. The first artist who practised the modern style were Bridgeman and Kent, who both lived in the early part of the last century, and the latter of whom carried Pope's ideas of what gardening should be extensively into execution. He banished verdant sculpture, or the clipping of trees into monstrous figures; he disdained to make every division of the garden tally to its opposite; he diversified the walks by groves of oak and cultivated fields; and above all, he abolished walls for boundaries, and introduced sunk fences. The country-seats in which the modern style was first employed are described by Shenstone, Mason, and Whately. Wright, Brown, Holland, Emes, and Repton, were the most distinguished successors of Kent in the art. Archibald, duke of Argyll, was among the first to introduce foreign trees and plants, with the view of colouring the landscape. The mixture of various greens, and the contrast of forms between our trees and those of other countries, were improvements unknown to Kent. The taste of the present day in landscape gardening has been chastened and refined by the writings of Price, Knight, Alison, Dugald Stewart, and other eminent authors. Gilpin and Prince Pückler Muskau are the most recent writers on the subject. ("Hints on Landscape Gardening." By W. S. Gilpin, Esq. 1832, 8vo. On the same, by Prince Pückler Muskau. Stuttgart, 1834.)

It is not every situation in which much can be effected in the way of actual landscape; therefore, in a level confined spot of limited extent, as will often be the case with the grounds attached to a small villa, it would be better not to aim at it, especially should there happen to be no prospect beyond their boundary, but rather to have recourse exclusively to ornamental gardening, by which term we would, for distinction's sake, denominate that species which admits more of the obviously artificial character, and more of studied, elaborate culture, than the other. The grounds immediately surrounding a residence ought always to partake more or less of this style, to serve as a connecting link between the building and the landscape scenery, properly so termed. Here a high degree of artificial beauty may be tolerated, provided the artificial be not suffered to degenerate into the unnatural; that is, the artificial must not show itself so as to shock common sense. We are aware that flowers disposed in parterres or planted in marble vases, trellises covered with trailing plants, level terraces, and uniform slopes, are not the spontaneous work of nature, but produced by the skill and industry of man; yet so are the roads of a country, the hedges which enclose lands, and tilled fields themselves. The very idea of a garden is that of a carefully cultivated spot; consequently the artificial character may be permitted to manifest itself decidedly in the ornamental species, care being taken that violence is not done to nature herself. Trees clipped into formal figures, and hedges cut to resemble walls, show the artificial carried to an absurd and perverse extreme, not only destroying the forms of the plants themselves, but without having any thing whatever to excuse it on the score of utility, convenience, or other advantage; whereas the disposing of flowers in parterres, or leading creeping shrubs over trellises, exhibits them to advantage, and conformably with their natural properties. A trellis mantled over with the leaves and blossoms of various "climbers" is hardly a more artificial object than a wall clad with ivy, which has certainly never been deemed unpicturesque. Whatever be the degree of ornamental character bestowed upon a garden or pleasure-ground of this description, we must still avoid that strict architectural symmetry which, being here misplaced, tends not to give the charm of regularity that we properly look for in buildings, but merely to produce a monotonous formality. A parterre, for instance, should not exhibit in its plan an exact pattern, hardly regular figures of any kind; neither should there be corresponding features reflecting each other: thus, should there happen to be a terrace, a flight of steps, or any thing else of the sort, it ought not to have its counterpart, but to be considered a distinct and complete feature in itself, as much as what is less evidently the work of human industry. When we once begin to affect *parallelism* and repetition in such matters, we exceed the allowable degree of the artificial, and act nearly as preposterously as we should do were we to cut two rivers or lead two roads running parallel beside each other. It is not the artificial, properly applied, which is contrary either to sound taste, or the picturesque; but that reduplication of it which not only occasions unbecoming formality, but utterly destroys variety. In ornamental gardening there may be the most studied display, and the study itself may be apparent; yet, however elaborately adorned, the whole scene may wear such an air of ease and gracefulness as not only to be most captivating in itself, but also eminently picturesque, and to furnish a delightful subject for the pencil.

For design, or the really artistical part of gardening, no positive rules of any kind can be laid down, either for the ornamental or the landscape style; there we must be governed by individual circumstances and situation. The only general rule which, as in all similar cases, is of least use to those who most need the assistance of any, is not to attempt more than the subject will bear, and to dispose of every thing with a view to effect. Be the grounds ever so decorated and ornate, there should ever be—we will not say simplicity, for the popular signification of that term would not very well convey our meaning, perhaps seem altogether at variance with such degree of embellishment; we will therefore say breadth and repose—qualities exceedingly compatible with richness and gaiety of expression, with brilliancy and sparkling effects. Of course this is to be understood *cum grano salis;* for it is not to be supposed that in such cases repose can be made a predominant characteristic; no more of it, in fact, is desirable than will suffice to temper down and subdue glaringness, to bring the whole into harmonious keeping, and to prevent flutter and fritter. As in aiming at richness we must studiously avoid falling into glare and gaudiness, which are a debased and corrupt species of richness, so must we take heed that we do not mistake the merely fantastic for the fanciful. In the strictly ornamental style, the latter may legitimately be employed, on the condition annexed to every thing which partakes of art, namely, that the result be satisfactory, which it certainly will not prove, should the fanciful exhibit itself only in trivialities and trumpery. No where ought we to be more upon our guard against triviality than where we are obliged to work entirely in little, because we are there most likely of all to fall into it, if we have recourse to factitious embellishment. We do not say that artifices are altogether unallowable, that in garden ornaments only genuine materials are to be employed; pedestals, for instance, of wood, painted to resemble stone, may be tolerated, provided they are introduced in situations where they cannot be too closely approached; but, let the material be what it may, the form of all such objects ought to be most carefully studied, and calculated to please a critical eye. Unless that be done, they had much better be omitted altogether, because so far from being ornamental, they prove the reverse, are contemptible in themselves, and betray ignorance and vulgar taste. Happily, the wooden Gothic summer-houses, Chinese alcoves, and other cockney conceits, together with "clumsy cupids squirting in a pond," have been long ago exploded by the deserved ridicule they incurred; still it is a question whether we have done well in suffering them to prejudice us against every thing of the kind. By a judicious application of ornamental building and arrangement, much may be effected within a small compass, and a striking degree of scenic character obtained.

Unlike the ornamental style, landscape gardening rejects, not only all artifice, but all indication of the artificial. It demands, not on that account less study; rather does it require more, and also the nicest delicacy of judgment and feeling, in order the better to conceal those very contrivances which bestow on the scene charms that nature had originally refused to it. It is not the factitious bloom upon the cheek of a beautiful woman, so much as the unskilfulness with which it is laid on, that offends the eye; the offence consists in the imposition being detected. The landscape gardener should bear this in mind; he must beware of painting too thick—of overdoing embellishment, till he pushes beauty to the verge of absurdity. Either he must make no attempt at concealing his machinery, or hide it most effectually, unless he is content to pass for a bungler.

The first requisite Prince Pückler demands in the embellishment of grounds is, that there should be unity of idea,—a *sine qua non* in every work of art. Such unity is not to be confounded with sameness; on the contrary, there must be both variety and contrast, yet of that species which nature exemplifies in her most propitious moods. Contrast must be so managed as to conduce to the harmony of the whole; there must be nothing forced or extravagant in it; and even the transitions from one scene to another, however sudden, should have nothing jarring, or that will disagreeably interrupt our preceding impressions. "It is not indispensably necessary," observes the Prince, "that in order to produce a powerful effect, a park should be of considerable size: owing to the unskilfulness with which it is treated, a very extensive space of land is frequently so cut up into patches as to be greatly reduced; while, by a contrary system, a limited one may be made to appear larger than it really is. In my opinion, therefore, Michael Angelo was altogether mistaken when he said of the pantheon:—"It is a wonder upon earth, but I will elevate it in the air," hoping thereby to obtain still greater effect. By giving the dome of St Peter's the same dimensions, he realized his boast; yet how unfavourable is the result! Erected upon an enormous mass of building, the dome looks comparatively diminutive and unimportant; while the pantheon, placed in a suitable point of view, has for centuries been an object sublime as the vault of heaven. Were they put upon the summit of Mont Blanc, the pyramids would appear no larger than sentry-boxes; and Mont Blanc itself, viewed from a remote distance, appears of no greater size than a heap of snow. Great and small, therefore, are only relative terms. It is not according to what it actually is, but according to what it shows itself to the eye, that we form our estimate of any object; and it is precisely here that a wide field opens itself to the landscape gardener. The tree, for example, which, although a hundred feet high, does not shut out the horizon, when situated in the middle ground of the prospect, would, were it only ten feet in height, do that, if no more than a few paces from us. Consequently, by a skilful management of the foreground, we may most easily, and most speedily, produce important effects, and give a striking physiognomy to the landscape."

But what, the reader will ask, is to be understood by "fore-ground?" A real landscape is not like a picture, where the eye is confined to a single point of view; for what is foreground in one situation becomes middle ground, or distance, when beheld from another. Very true: the same foreground cannot possibly remain; yet, although we cannot retain the *same*, there should always be *a foreground*, that is, along the whole of the direct course through which the spectator passes. It is with reference to such course that the landscape gardener must work; this he must consider *a series of stations* from which so many pictures are to be viewed; casual ones there may be, to be obtained by desultory and random rambling in any direction, —and, indeed, in beautiful scenery they can hardly fail to occur; but, as concerns the actual laying out of the grounds, it is only certain definite points that can be subjects of study, and other results and combinations must be left more or less to accident.

In the foreground itself, as well as elsewhere, there must be variety; otherwise, whatever merit it may possess in itself, it would appear too *mannered.* Diversity of shape, of colour, of light and shade, must all be secured; and every advantage must be taken of inequalities of surface in the ground: gentle undulations and swells, abrupt breaks and hollows, may all be turned to account for this purpose. The larger features of landscape are not equally under our control: should nature have been niggardly to the site in this respect, we can do little towards counteracting her parsimony, save in the way of planting, imparting to the scene variety of verdure, and the richness of sylvan luxuriance. From the tangled thicket to the light open grove, between the interstices of whose foliage the sunbeams dart and flicker upon the rich grassy sward—from the plant and shrub, to the majestically spreading tree — all these may be formed; though, in regard to objects of the last-mentioned class, it must be confessed that they require more than the growth of a few summers for their development, nor, unless previously existing on the spot, can they very conspicuously adorn an entirely newly-formed place. On that very account are they all the more to be prized and cherished when we actually possess them, as ornaments of the scene not to be replaced by ourselves or our immediate successors when once destroyed. Independently of their nobleness as objects of sight, the aspect of venerable trees and woods exerts a powerful influence over the mind; there is a charm even in the very monotony of a dense and uninterrupted screen of wood, and, when viewed from an eminence, such an expanse of foliage and verdure partakes, like the ocean, of the sublime.

In conformity with the character of the scenery should be the character of the house, whether that be castle, Grecian edifice, manorial building, or cottage ornée. To scenery possessing an abrupt romantic character, and the site limited to a small extent, the castle is well adapted: its towers harmonize with the rocky steep. Gentle undulations, with sufficient extent for lawn and shrubberies, are best graced with a Grecian edifice, which courts variety and cheerfulness; while the manorial building loves to be tranquilly embosomed in the deeper shades of a woody and romantic scene. The cottage ornée and the forest-lodge may be appropriately placed amid picturesque and rural scenery.

In regard to the site of the house, it ought rarely to be placed on the highest point of the domain, particularly if that point is of considerable height. Nor should a house be placed parallel to a river or a valley. The best situation for a house is on a platform, with a rising ground behind it, and a depth below it, and the windows of the living rooms of every house in this cold climate should face the south. To preserve these entire, the entrance hall should be placed in some other quarter. Every house should be constructed so as to conform with the extent of the domain,—the immediate ground on which it is placed,—the scenery it commands,—the shelter requisite to comfort within it,—and the access to it. The manorial style can admit of much greater picturesque effect than any other, in conjunction with the offices, by giving greater extent and variety to the pile, than can be obtained in any of the square-like styles of architecture. Indeed, the irregularity in the manorial building is highly beneficial, both in the variety of the outline, and in the light and shadow resulting from it, the want of which is so obvious in the square flat surface of so many of our modern houses.

Though too much stress should not be imposed in forming a particular character for the approach, yet, it must be confessed, much enjoyment may be derived from it, as a drive or a walk through scenes which may not be accessible to the windows of the house. An approach, as Mr Gilpin truly says, should appear as an unstudied road to the house; and the scenery which it should command should depend on the nature of that seen from the residence. If there the view is extensive, the approach should wind through a humbler path; but should the house be confined among trees or rocks, then it should display all the variety and beauty of landscape which it is possible to obtain along its course. It should break off at a large angle from the public road, and avoid all curvilinear sweeps.

It may deviate from the course of its destination when any object of sufficient magnitude and importance appear to stand in its way. It may have inclination and declination in it, though these should never be purposely thrust in its way. Mere length is not a necessary character of a good approach; that character can only be derived from the kind of trees and shrubs with which it is embellished. These embellishments should be in unison with the scene. If a dreary space has to be passed over, an avenue of stately trees will divert the attention. If the country around is picturesque, natural groups of trees and shrubs, such as holly, thorn, furze, broom, will be most conformably placed along the approach. If romantic, then angular projections of rock, roots of trees, holding fast by rugged banks, large forest-trees scattered about in wild profusion; and ivy, fern, foxglove, and such plants, may adorn the skirts of the road. Whatever be the nature of the scene, exotic plants are quite misplaced near an extended approach. They can be tolerated only towards a cottage ornèe; a villa near a town, which is generally limited as to the extent of ground around it; or even towards a large domain, the ground around which is laid out as flower-gardens and shrubberies.

The character of the entrance-lodge has caused much discussion among landscape-gardeners and architects, without leading to any fixed principle. Mr Gilpin thinks lodges ought to be constructed in conformity to the nature of the scenery in which they are to be placed, rather than in regard to the architectural character of the house to which they belong; and the judicious examples which he adduces, as appropriate adaptation of lodges, support his views in a striking manner. Should the approach require a bridge, it should partake of the character of its situation. An architectural bridge should only be erected over a river of the larger dimensions; while a wooden one of simple construction, or arches of masonry surmounted with wooden rails for a parapet, will best suit to embrace a rivulet, or extend across a ravine. Whatever may be the structure of the bridge, it should be always horizontal, and have a light and airy appearance. On this account, rustic bridges are out of place, excepting in some remarkably umbratile and romantic spot, through which the road may wind between masses of rock and falls of water.

The adaptation of dress-ground around the house to the nature of the surrounding scenery, forms perhaps the most difficult department of the landscape-gardener. Had he to form a residence, with its accompaniments, on a bare piece of ground, it might be possible to cause all the component parts of the landscape to harmonize; but where there are existing old trees or buildings, which may have been originally disposed quite out of keeping to every thing around them, it is difficult, sometimes impossible, to apply the principles of harmony to them. And yet it would be barbarity to get quit of them "at one fell swoop." In such instances it is difficult

"To lead with secret guile the prying sight
To where component parts may best unite,
And form one beauteous well connected whole,
To charm the eye, and captivate the soul."

"Most places," says Mr Gilpin, "besides the features of the class to which they belong, have some peculiarities of their own, either as respects the general expression of the whole, or the circumstances of the parts, as the ground, the trees. The eye of taste will carefully observe these varieties, as on the due improvement of them at each place, rests, in a great measure, the variety of its own character, and its distinction from others of apparently similar features. Composition in landscape embraces three distinct parts, the *distance*, the *middle distance*, and the *foreground*. The first of these is out of our reach of improvement in itself, but will contribute more or less to the general effect of the scene, according to the treatment of those other parts which are under our control. And here it may not be improper to observe, that the very natural pleasure arising from extent of prospect has done much mischief, both in placing the residence, and in dictating its accompaniments." The indistinctness and variety of a distant view, no doubt, is highly interesting; but other and more important considerations should not be sacrificed to that alone. The middle distance may be within the reach of improvement, especially if the domain is extensive. If the middle ground consists of bold swellings, the plantations may be made to rise above the horizon, and break it where that is necessary. Should it be flat, the plantation should be so placed as to hide that flatness. But, of course, it is the foreground over which the greatest control can be exercised. Here the landscape gardener may exhibit his ingenuity in the highest degree; and here his knowledge of landscape-painting comes to his assistance with powerful effect.

Mr Gilpin regrets the total destruction of that grand and well defined foreground to the landscape, as seen from the windows of the mansion,—the terrace; and asks what compensation we have received in exchange for it, in the bold, exposed, and windy gravelled roads which surround our modern residences. On the removal of trees in the foreground for scenic effect, he says, "it will be remembered that *removal*, in common with every measure connected with improvement, must act mainly upon the local circumstances of the place, and, consequently, will only admit of general suggestions, by which the proprietor may be awakened to the subject; so far at least as not to destroy the character of his place, by substituting the boldness of the modern system for the rich formality of the old school. The hand of taste will cautiously withdraw the veil which separates them, and, by degrees, admit the surrounding scenery without destroying the shelter and partial seclusion so essential to the mansion we have been considering. Cheerfulness, rather than gaiety, should be the proposed result." And on the formation of the dress-ground, he remarks:—"The dress ground immediately connected with the house should be considered as the foreground of the picture, which the whole scene taken together presents to the eye, and should be treated as such. The groups and single trees upon it should be planted with reference to the scenery beyond, so as to lead the eye into the remote parts of the picture; excluding, as far as may be, whatever might injure the general effect."

Gravel-walks are necessary for the enjoyment of the scenery around. They must be formed according to the size and circumstances of the place. They should never be carried round the boundary of any particular spot, such as the dress-ground, the lawn, or a lake. The width of walks must be regulated by the use to which they are to be appropriated. Walks should break off at large angles from each other, and no two lines of them should be seen at the same time.

There is nothing more difficult in landscape-gardening than the production of a good effect by artificial water. Nature seems extremely jealous of being imitated in her liquid form. These imitations will be more or less natural, according to the nature of the ground which is to be appropriated to the use of water; so that, if a combination in form and extent of water be formed with the surrounding ground and trees, the highest finish will be given to the scenery of the park. Lakes, pools, and rivers, are the only forms which can be advantageously made use of. As with plantations so with lakes, the outline is the chief object of beauty; and if the indentations in the shores are rather bold and contrasting, than numerous, the effect will be much heightened. The points or headlands must be placed so as to be most effective, either from the windows of the house, or from some other more favoured spot for obtaining a view of the grounds. The point of greatest difficulty in the formation of a lake is its head, which being generally the deepest part of the water, and the water there being confined by a low embankment, islands or trees must be so arranged as to destroy the idea of an artificial termination. The shores and bays of a lake should not run parallel to the house, and the various promontories ought to be of different forms and heights, and, if possible, composed of different, but harmonizing, colour, of rocks or earth. Islands must not be placed in the centre, but so arranged and formed as if they had been detached from the higher banks of the lake, or deposited by the passage of a river through it; and even a peninsula properly formed, carrying an extremity of a large plantation into the lake, may have an imposing effect. Aquatic plants, such as the nymphæa, the reeds, the bulrush, and the flag, will produce a picturesque effect in an eddy, or conceal the termination of a low shore. A pool is just a small lake.

As to the mode of making the shores of the lake, Mr Gilpin says, "In the commencement of the operation, I should recommend (as in forming a plantation) the marking on paper the existing state of things, and adapting the situation, form, and circumstances of the water to be created, so as to produce an *harmonious whole;* infinitely more important than the size or even the beauty of the water, simply considered. The general form of the water being staked out, the digging should not be taken too close to the form given, but at different places should be more or less within it, so as to give an opportunity for the water to form its own line against the bank. Parts also of the intended embankment might be left, as first broken down with the pick-axe, rather than be more determined by the spade. Upon the same principle, the earth should be so heaped upon the different hillocks, as to allow room for it to fall irregularly towards the bottom, as nothing can be more unnatural than a hanging level, as the workmen term it. Though the principal varieties of form will be obtained, where the shallowness of the water admits but of the operation, yet in forming the head, it is desirable to give some variety to its outline, instead of the straight line, or uniform curve, which usually characterises it. One bold promontory, shooting into the water, would divide the length of the head, especially when it is of considerable extent. Great improvement also might, I conceive, be made in the construction of the head, by giving variety to its surface, instead of making it a dead level, as is usually the case. This variety of surface would, moreover, give opportunity for planting near the water, which cannot be safely done on the level surface, for fear of injuring the puddle bank."

Of the river, Mr Gilpin says, "the banks of the river, though not so boldly contrasted as in the wilder scene, will still admit of considerable variety in their decoration. The smooth grassy bank, sliding almost imperceptibly into the water, will be relieved by a jutting point, formed with the varieties of water plants, enriched, if circumstances will allow, with fragments of stone of different size and colour; groups of alder or willow will occasionally break the margin, or the pendant and massive foliage of the wych elm will throw its broad shadow across the retiring reach. These, and such like circumstances, are essential to the completion even of the happiest form that the artificial river can assume."

In interfering with the character of a natural brook, it should be well considered, before it is sacrificed for a piece of water, whether the latter can be so formed and decorated as to warrant the change.

LATHAM, JOHN, M.D., F. R. S., &c., an eminent ornithologist, was born at Eltham, in Kent, in 1740; followed the profession of a surgeon; and died at Winchester, in 1837. This venerable man devoted himself to his favourite science of ornithology, with undiminished interest, to the close of his long life, which was extended to his ninety-seventh year. His writings on ornithology were very voluminous, and are essential to every student; for, though his views are perhaps limited in some respects, compared to those of more modern authorities, he made important use of the labours of previous naturalists, and added many species to those formerly known. His great works are: "Index Ornithologicus," in two vols. 4to. 1790; and "A general History of Birds," in ten vols. 4to. 1821—1824.

LATIN LEXICOGRAPHY. The progress of Latin lexicography in modern Europe has not been rapid. The *Catholicon* of John of Genoa, the earliest printed work in this department, first appeared in 1460. It was published, as appears from its date, in the infancy of the typographical art; and is supposed on good authority to have proceeded from the press of Faust, who among the Germans is believed to have been the inventor of the art of printing. The name of Faust, however, does not appear in the volume. The author of this lexicon finished his work in 1286, and was probably aided in his labours by the use of the older vocabularies, particularly that of Papias, a Lombard, who flourished in the eleventh century, and also that of Ugo or Uguccio, an ecclesiastic of Pisa, and afterwards archbishop of Ferrara, who lived about a century later. The supposition of an earlier edition of the *Catholicon* than this of 1460, struck from carved blocks of wood, has not sufficient authority. This work was, without doubt, very imperfect, and appears to have been marked with no considerable erudition. The explanation of words relating to theology was somewhat better than that of others, as might be supposed from the profession of those employed in its composition. With all its defects, however, it was not wholly destitute of merit, and passed through several editions, both in Italy and France.

Omitting several names of less note, we would mention John Reuchlin or Capnio, a German, and Nicholas Perottus, archbishop of Siponto, as numbered among those who in the fifteenth century deserved well of Latin lexicography. But one of the most known of the early Latin dictionaries was that of Calepin. The author was a monk, and took his name from a small town called Calepio, in the territory of Venice as it then existed. Calepin made liberal use of the labours of his predecessors in the preparation of his work, but, as at first published in 1502, it was of no great value. Succeeding scholars corrected some of its errors, and supplied some of its defects, and numerous editions of this dictionary followed each other. Among those who laboured to improve the lexicon of Calepin, are found the names of Joh. Passeratius, Jac. Montanus, Lud. de la Cerda, Conrad. Gesner, and Budæus.

In the early part of the sixteenth century, this department of Latin literature received a valuable addition in the well-known *Lexicon Ciceronianum* of Nizolius. This work, as improved by its successive editors, especially by Facciolati, exhibits in a form easily accessible the great body of Ciceronian Latinity, and, though substantially incorporated into later dictionaries, is still of great use to the student. It was less, however, the object of Nizolius to define the meaning of words, than to furnish forms of expression, and a general phraseological storehouse. But the claims of lexicography were not wholly disregarded. The author arranged the phrases, which he had collected, under distinct heads, though not always with a just discrimination; and this Thesaurus was an important accession to Latin literature, considered merely as a dictionary.

Robert Stephens, who was so highly distinguished both as a scholar and a printer, first published his *Thesaurus Linguæ Latinæ* in 1531. This was a work of great labour and value. The author issued a second edition in 1536, and a third in 1543, with large improvements.

In the year 1571, was published at Leipsic the first edition of the *Thesaurus Linguæ Scholasticæ* of Basil Faber. This author, in the composition of his work, departed in a great measure from the track of his predecessors. It was not his aim to furnish a vocabulary of the Latin language, with a bare explication of the meaning of words, but to enter more largely, than had hitherto been done, into the regions of poetry and criticism, and to exhibit in addition an extensive view of idioms, peculiar constructions, and elegant phraseology. Hence his quotations from the Roman authors, both in prose and verse, are numerous and extended, and often selected with judgment and taste. Illustrations of mythology, geography, and history, constitute an important part of the work, and at the time of its appearance must have rendered it peculiarly valuable. The Thesaurus of Faber was improved by succeeding editors, and especially by Joh. Matt. Gesner, whose edition appeared at Leipsic in 1726.

Johannes de Garlandia, who flourished in the eleventh century, was the first Englishman who turned his attention to compiling a Latin dictionary, and his *Synonyma et Æquivoca* was first published at Cologne, in 1490, and soon after in London. About half a century after, Thomas Elyot published his *Bibliotheca*. Elyot was succeeded by numerous authors in the same department, among whom the most noted were Thomas Cowper, Francis and Thomas Holyoake, and Adam Littleton. This last-named lexicographer acquired the most reputation by his labours; and his work, especially as improved in the Latin dictionary published at Cambridge in 1693, has very considerable value. The editors of this last work, among other aids, had at their disposal a manuscript collection of authorities from Roman authors, in three volumes, folio, by John Milton.

In the year 1735, a corrected and enlarged edition of the dictionary of Robert Stephens was published in London. In preparing this work for the press, the editors aimed to combine with the Thesaurus of Stephens some of the peculiar excellencies of Faber. Their efforts were in a good degree successful; and the publication of the London edition of Stephens brought this branch of lexicography to such a state, that, with the increased means of literary labour, and the new zeal which was manifest in every species of improvement, its subsequent more rapid advance towards perfection might be easily anticipated.

In the mean time, as the only Latin dictionary common in the English schools was that of Coles, which was full of errors and defects, proposals were made in 1714 to Mr Robert Ainsworth, who enjoyed a high reputation for his knowledge of the Latin language, to prepare a new dictionary, which should better answer the public demand. This he undertook; and after having laboured, with some interruptions, for more than twenty years, in 1736 he published his *Thesaurus Linguæ Latinæ Compendiarius*. The English-Latin Part was a great improvement on any thing of the kind which had preceded it. In the Second Part of the work, where the Latin precedes the English, the arrangement of the definitions was new. Each meaning was numbered, and the authorities, which were placed in a body after the English definitions, were numbered in the same manner for the ease of reference. This was thought an important improvement; but it may be justly questioned, whether the use of this disposition of the authorities is not rather apparent than real. The eye, perhaps, may pass more readily from one part of a definition to another, so far as the English is concerned; but if the authorities on which the definitions rest are to be consulted, a course almost always useful, and sometimes necessary to the student, there is an obvious source of embarrassment. And it will probably be found, likewise, that students, in consequence of this separation, often fail to consult the authorities as they ought, and to receive that advantage from them which they are designed to afford. This dictionary of Ainsworth was very favourably received; but with some excellences it had likewise its faults. Succeeding editors have somewhat improved it; but on comparing in various places the late London stereotype edition with that of 1736, the changes appear to be few. Some errors have been corrected, and some deficiencies supplied, but the work is essentially what it was at first.

In the year 1715, a new Latin Lexicon was begun at Padua, chiefly at the suggestion, and under the superintendence and advice of Jac. Facciolati the head of the university. Facciolati was advantageously known by his labours in the promotion of Latin literature, particularly by his edition of the *Lexicon Ciceronianum* of Nizolius. He was likewise distinguished as one of the best writers in the Latin language among the moderns. To execute this work, he employed Egidio Forcellini, who had been his pupil, and who appears to have been every way qualified for the undertaking to which he was invited. At first the views of these scholars extended no further than to an enlarged edition of Calepin. This they finished in about four years; but, in the course of the work, they had become so sensible of the inherent and irremediable faults of Calepin, that they determined to begin a Latin lexicon, in some respects, on a new plan, and which should be independent of all that had preceded it, in the selection of words, in the definitions, and the arrangement of the senses. To the accomplishment of this great literary project, Forcellini applied himself with uncommon assiduity, and in 1761 the lexicon was completed. It was first published in 1771, several years after the death of the author. The names of Facciolati and Forcellini are united in this work, but it ought in justice to be stated, that the principal merit of its execution belongs to the latter. Facciolati himself says in reference to it, "Vix ego in plerasque voces quippiam contuli præter consilium, in multas autem ne consilium quidem."

The plan of this dictionary was digested with great care and judgment. The ancient authors in the Latin language were classed according to several chronological periods; as the purity of their style is found to correspond, in a great measure, to the age in which they flourished. The first period, extending from the time of the earliest Latin writers to the death of Augustus, and constituting the golden age of Latin literature, furnishes the great body of authorities on which the explication of words is grounded; later authors being referred to, in general, only as they in some way illustrate the earlier class, or afford some new meaning. In this way the rank of words and idioms as to their purity, and, for the most part, as to their propriety and elegance, is easily settled. To illustrate this portion of the work in part, reference may be made to the word *ala, a wing*. Here the combinations "movere alas," and "quatere alas," are quoted from Virgil; but "explicare alas" is referred to Martial, and "expandere alas" to the elder Pliny. "Quatere alas" is found likewise in Pliny; but Virgil is properly named as authority for this expression, as being an earlier writer.

It may be here remarked, that it ought by no means to be concluded, because phrases, idioms, or words occur in writers of a late date, that they were not current in the best age of the language. It is clearly possible, that many of them might have been, and without doubt some of them were used in the lost works of Cicero, Sallust, Livy, and others of the same literary period. In a fragment of one of Cicero's orations, recovered by Mai, is the word *lenities*, which had before been placed in glossaries only. If the reading of this fragment is admitted to be genuine, *lenities* can no longer be considered a word of suspicious or base origin; and, from the manner in which it is employed, this word was manifestly in common and reputable use. In a fragment of Cicero's treatise "de Republicâ," first published by the same editor, is the word *convenicium*, which, at the time of the discovery of this fragment, had been long lost from the language. But the consideration stated above can have no influence on the composition of a dictionary, which must of necessity be constructed of materials actually existing.

The next important principle, settled by Forcellini in the composition of his Lexicon, respected the classification of meanings and their arrangement. This branch of the subject had been treated by preceding lexicographers with much less care than its importance demands. Very different meanings had often been confounded, and distinctions often introduced, where there was really no difference. The labours of the author here were attended with distinguished success. It would be perhaps too much to say, that he is never in error. The difficulties in the way of a clear and unobjectionable classification of meanings are in some cases nearly or quite insurmountable; but that he improved greatly on all who preceded him, is undeniable. In the arrangement of the meanings, that is placed first, which from the use of a word among authors of the first class, appears to have been the earliest, and from which there is the most ready and easy transition to other meanings; and these again are made to follow each other on the same principle. All parts of a definition, therefore, illustrate each other; and, from a comparison of the whole, the real force and import of a word can hardly be mistaken.

As to the definitions, very little is made to depend on an accumulation of synonyms, a method which often obscures rather than elucidates a signification. Definitions are given for the most part in descriptive language, so precise and definite, that, with the subjoined examples, the reader is satisfied, that he has every thing before him necessary to a full understanding of the case in question. Robert Stephens, in the first edition of his lexicon, defined the words in the French language. In the second and third editions, the French was excluded, and Latin was introduced. One reason for this change was to procure for his work a more general currency. Forcellini has given first the corresponding Italian word, then the Greek, and, after these, the full definition in Latin. Care is likewise taken, in the selection of authorities, that the different constructions of a word with others should be exhibited, so far as such constructions affect the sense.

The metaphorical senses are also distinguished from the literal. Names of the gods in ancient mythology, names of persons current in the history of the fabulous and heroic ages, and names of places, rivers, mountains, and whatever else relates to the same early period, are inserted with the proper references to the authors from whom the information is derived. Besides the classes of words already mentioned, others of no authority, or for the most part barbarous, are thrown into an appendix. Such is the general plan of the Latin Lexicon of Facciolati and Forcellini, which hardly admits of improvement; and the execution in every part shows extensive learning, great accuracy, diligence, and sound judgment. That, in a work so extensive, every part should be executed with equal success, is not to be expected. The most, however, that succeeding editors have accomplished, is to supply a few omissions; and this lexicon deserves to be reckoned among the most perfect works of the kind which have ever been composed.

While this dictionary of Forcellini was in progress, a new Latin lexicon was undertaken in Germany, by John Matth. Gesner. His scheme was, to make the London edition of Stephens the basis of his work. In making improvements in this, he professes to have removed many excrescences, to have corrected numerous errors, and to have made large additions. This lexicon was published in 1749, and was a most valuable contribution to lexicography. Not being an independent work, as the author chose to make few alterations in the plan of Stephens, it has less uniformity of execution than the Lexicon of Forcellini. The different senses of a word are not always philosophically arranged; and authorities are sometimes furnished in disproportionate numbers. The definitions are in Latin, and generally clear and full. As a storehouse of the varieties of Latin phraseology, the Thesaurus of Gesner is of the highest value to the student of Latin literature.

A work was still wanting in this department, of a more popular character; and accordingly, in 1783, J. Im. G. Scheller published his copious German-Latin and Latin-German Lexicon, which, as a universal dictionary of the Latin language for the use of students generally, has some advantages over Gesner. The arrangement of words is throughout alphabetical. In the Thesaurus of Gesner, the order of derivation is observed. The definitions are in the German language, and the authorities are selected with admirable judgment, both for confirming the significations assigned to the words, and illustrating the varieties of grammatical construction. Many of these passages are translated, especially where any difficulty can be supposed to exist. To the arrangement of the different meanings of words, Scheller has paid unusual attention, and the whole work is digested throughout on a uniform plan. This Lexicon was received in Germany with great approbation. Two editions of it were published by the author; the third, which appeared in 1804, soon after the death of Scheller, had been revised by him. No stronger proof is needed of its excellence, than the fact, that for more than half a century, as a Thesaurus, it has not been superseded in Germany. An abridgment of it has long been used in schools, and a valuable manual Latin lexicon, chiefly derived from Scheller, has been published by Luenemann. An English translation of Scheller has been lately printed at Oxford; but, so far as we have had opportunity to examine it, we have not formed a high opinion of its merits.

In the year 1799, an edition of Scheller was published in Holland, which had been prepared under the direction of Rhunken. Scheller, in the same manner as Gesner and Forcellini, made his work a general lexicon of the language. The Leyden edition, by the advice of Rhunken, was limited to the proper classic authors, or such as have some reputation for purity in the choice of words. The reasons assigned for this course are not altogether satisfactory. Words used by authors of little note actually occur, and the student needs some explication of them. At least it may be useful to know on what authority such words rest; and, if the writer who has first used them is named and characterised, as is done by Forcellini, there is little danger, that a dictionary so constructed will give currency to barbarisms.

LAUDERDALE, James, Earl of, a distinguished public character, was born at Hatton, in the county of Edinburgh, on the 26th Jan. 1759. He was early placed under the superintendence of the learned Andrew Dalzel, LL.D. afterwards professor of Greek in the university of Edinburgh: he also studied at the college of Edinburgh, and at Glasgow, where he attended the judicial lectures of professor Millar, and he completed his education at Paris. Returning home, his lordship was admitted a member of the faculty of advocates, 1780; was chosen member of parliament for Newport, in Cornwall, at the general election, same year; and for Malmesbury, 1784; rendering himself conspicuous in the House of Commons by his opposition to lord North's administration, and attaching himself to Mr Fox, the friendship of whom his lordship considered as the honour of his private life, and a steady adherence to his political principles, as the sole merit of his public character.* He was an energetic supporter of Mr Fox's India bill, and one of the managers of Hastings's impeachment. Succeeding his father, 1789, his seat in the House of Commons became vacated; but, at the general election, 1790, he was chosen one of the sixteen representatives of the Scottish peerage, and followed the same line of conduct in the House of Lords, taking a frequent share in the debates. The state of his lordship's health rendering a few months' residence in a mild climate expedient, he left England in August 1792, accompanied by Dr Moore, who published a "Journal during a residence in France from the beginning of August to the middle of December 1792."

His lordship, in 1794, published his "Letters to the Peers of Scotland;" and 2nd June 1798, moved an address to the king for peace, which was negatived by the House of Lords. The same year he warmly exerted himself in opposition to the Habeas Corpus suspension act, the sedition bills, and other measures of administration. His lordship published in 1796, the "Substance of a Speech in the House of Peers on the National Finances;" in 1797, "Thoughts on Finance, suggested by the Measures of the present Session;" in 1798, "Letter on the present Measures of Finance, in which the bill now pending in parliament (for tripling the Assessed Taxes), is particularly considered;" in 1804, his elaborate work, "An Enquiry into the Nature and Origin of Public Wealth, and into the Means and Causes of its Increase," (2nd edit. 1818); and in the same year, "Observations on the Review of his Enquiry into the Nature and Origin of Public Wealth, published in the eighth number of the Edinburgh Review;" and in 1805, "Thoughts on the alarming State of the Circulation, and the means of redressing pecuniary Grievances in Ireland:" and, "Hints to the Manufacturers of Great Britain on the consequences of the Irish Union, and the System since pursued, of borrowing in England for the service of Ireland."

On the dissolution of the Pitt administration, 1806, the Earl of Lauderdale was created a peer of the United Kingdom of Great Britain and Ireland, 15th February, 1806, by the title of baron Lauderdale, of Thirlestane castle, in the county of Berwick, was sworn a privy councillor, and had the Great Seal of Scotland delivered to him, 21st July, 1806. On the change of administration, the duke of Gordon was re-appointed keeper of the Great Seal of Scotland, 11th April 1807. The Earl of Lauderdale now having an hereditary seat in the House of Lords, exerted himself actively in parliament, and published in 1809, "An Inquiry into the Practical Merits of the Present System for the Government of India under the superintendence of the Board of Control;" "Further Consideration of the State of the Currency; in which the means of restoring our Circulation to a salutary state are fully explained, and the injuries sustained by the public treasury, as well as by the National Creditor, from our Present Pecuniary System, are minutely detailed, 1812, 1814;" "Letter on the Corn Laws, 1814." The pamphlets from his lordship's pen had considerable weight attached to them at the time that bullion and other questions occupied the public attention. In politics, lord Lauderdale's opinions were, for that period, considered to be extreme; and his appearance in the House of Lords in the rough costume of Jacobinism made quite a sensation when the principles of the French Revolution were in vogue with the democratic party in this country. For the last ten years of his life his lordship lived in retirement, devoted to agricultural pursuits. His death took place at Thirlstane castle in Berwickshire, on the 13th Sept. 1839, at the age of eighty years. The earl of Lauderdale married, on the 15th of August, 1782, Eleanor, only daughter and heiress of Anthony Todd, Esq. secretary to the general post office; and by that lady, he had four sons and five daughters. At Dunbar every demonstration of the deepest sorrow was manifest at the loss the inhabitants had sustained by the death of so good and considerate a landlord. A bust of the Earl of Lauderdale, by Nollekens, was exhibited at Somerset house in 1804.

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* It is a singular coincidence, that Mr Fox and lord Lauderdale, two of the most intimate friends that ever lived, were born on the same day (24th January) and died on the same day (13th September). Mr Fox was ten years older than lord Lauderdale, and lord Lauderdale survived Mr Fox thirty-three years.

LAUNCESTON; a town in the county of Cornwall, situated about 210 miles W.S.W. from London, and eighty-four from the Land's End. The county assizes, which used to be held at this town, are now held at Bodmin, in consequence of the situation of the county jail there, and the completion of new courts at the latter place in 1838. Before the Reform Act, Launceston returned two members to parliament, but it now joins with Newport in returning one. Population in 1841, 2460.

The *Castle of Launceston* is, perhaps, one of the oldest in England, and appears to have been in a very ruinous state, even as far back as 1337. An official survey at that time, describes "A hall with two chambers; a smaller hall called the Earl's chamber, with another chamber, and a small chapel adjoining; a larger chapel, another small hall, a few other rooms, and two prisons: there were two rooms, also, in the tower or the keep, but much out of repair." In 1602, the ruins consisted of "a decayed chapel in the base court, a large hall for holding the shire assizes, the constable's dwelling-house, and the common gaol." In 1650, only one old tower remained in tolerable preservation, which was used as a prison. There are now scarcely any remains of the castle, except the keep, which has been described by Leland, as "the strongest, though not the biggest, he had ever seen in England." From the massive nature of the building, and the entire absence of Saxon ornament, it is supposed to have been built by the ancient Britons.

LAW, COURTS OF, in England. The members of the profession of the law in England, as in most European countries, are formed into different and distinct classes, each of which performs a distinct part of the labours of the profession. And for each of these classes a different course of study and education is requisite. In the courts of common law all the subordinate labours of the profession are performed by persons who are denominated attorneys. The attorney acts as a sort of agent of the party, in conducting his law business, and holds all the correspondence with him. He is a middle man between the barrister and the client. He obtains advice for him in cases of doubt, or difficulty, draws contracts and instruments for him in ordinary cases, and causes instruments of conveyance and other instruments, to be drawn for him by conveyancers in difficult cases, and attends the execution of them. He makes his client's demands upon debtors; commences his suits when plaintiff, and enters an appearance for him when defendant; watches the progress of his suits or cases, attends the prosecution or defence of them to final judgment; obtains advice respecting the proceedings when necessary, in every stage of their progress; gives the requisite notices; procures the pleadings to be drawn and motions to be made; collects, arranges and prepares the evidence for the trial; and employs barristers to argue the case to the jury, and when necessary, to the court. His office is highly respectable and often lucrative, but in rank and dignity far below that of the barrister. Labours of a similar kind in the courts of equity are performed by persons denominated solicitors. Formerly, the offices of attorney and solicitor were entirely distinct, but in later times they have been usually discharged by the same person, who is admitted to practice both as attorney and solicitor. The attorney and solicitor in the courts of common law and equity, answer to the proctor in the ecclesiastical courts and courts of admiralty, by whom similar labours are performed in those courts.

When it becomes necessary to address the court, to make a motion, or argue upon a question of law or fact in the cause, to the court or jury, if it be in the courts of common law, a barrister or sergeant at law must necessarily be employed for that purpose, and if it be in the ecclesiastical courts or courts of admiralty, an advocate at Doctor's Commons must be employed, who alone are allowed to perform such offices in these courts. The practice of certain of the barristers is generally limited to the courts of common law. Others practise wholly or principally in the courts of equity. Of those who generally practise in the common law courts, some usually attend the courts of common pleas and exchequer, others more commonly appear in the court of king's bench, and many, perhaps rather from necessity than from choice, are most frequently seen in attendance at the criminal courts at the Old Bailey and the courts of quarter sessions. Of those who practise chiefly in the courts of equity, some attend usually before the lord chancellor, others before the vice chancellor, others before the master of the rolls, and many before the court of bankruptcy and the insolvent debtor's court. Barristers who practise in the courts of common law, as well as those who practise in the courts of equity, and the advocates at Doctors Commons, argue cases on appeals before the House of Lords. Many barristers too, are in the practise of appearing before committees of the House of Commons, and occasionally in some of the city and county courts, and before the judges at their chambers as well as before the sheriff's jury. And a limited number of the younger barristers commence their professional career in the court of Marshalsea and Palace Court. But in matters before the judges at chambers in ordinary cases, and in the sheriff's court, and before the commissioners of bankruptcy, and the court of requests and in some other of the subordinate courts, the attorneys are allowed to and usually do perform the duties, which are alone performed by barristers in the higher courts. Barristers practising in the courts of common law and advocates at Doctors Commons, are occasionally employed before the chancellor, in arguing questions relating to the particular branches of law, with which they are, from their course of practice, respectively most familiar. Some barristers rarely if ever appear in court, being employed chiefly as special pleaders, or equity draftsmen, in preparing the written pleadings of the litigant parties, or as conveyancers, or chamber counsel.

The right of practising pleading and audiences in the court of common pleas was formerly exercised exclusively by persons holding the highest rank in the profession, and of the degree of the coif or sergeants at law; but by a recent royal warrant barristers have now an equal right and privilege to practise in that court; and the precedence is conferred on the sergeants of law already created. Future sergeants, if any should be created, will take rank next after the king's counsel, or those who have patents of precedence. King's counsel have precedence, according to the dates of their appointment. They answer in one respect to the *advocati fisci* of the Romans, as they cannot, without a licence, be employed against the crown. And barristers having patents of precedence, rank according to the dates of those patents, and those having no patents of precedence, have precedence after the king's counsel, sergeants at law, the queen's attorney, and solicitor general, and the recorder of London, according to the dates of their call to the bar. Barristers, advocates and sergeants never, on any occasion, have any interviews whatever with their clients. They confer only with the attorney, solicitor, or proctor. No action can be maintained by them for their fees, which are regarded as *quiddam honorarium*. They are employed not for the cause, but for the occasion only; and have no concern with the cause, or the fate of it, beyond the particular occasion for which their services have been engaged. It often happens that the opinion of one or more barristers is obtained respecting the legality of the demand or defence, that another is employed to make the declaration, or draw the answer or plea, that a third is employed to make a motion, that a fourth is employed to argue the case to the jury, and a fifth to argue some question of law or equity to the court. The brief, containing an abstract of so much of the case as is important for the occasion, with the fees, is delivered by the attorney at the time of the retainer. England, for the purpose of trials at *nisi prius* is divided into several circuits; two judges attend on each circuit. A certain number of barristers also attend the courts on the different circuits to argue causes at the *nisi prius* sittings before the court and jury. And it is a rule well understood and observed, that no barrister can go on more than one circuit unless upon a special retainer. When commencing practice he may go on a particular circuit once or twice to try his luck, and then change that circuit for another. But after this trial, he is not permitted to change his circuit during his practice. After being appointed the king's attorney or solicitor general, he is obliged to give up his practice on the circuit entirely, excepting in cases where he shall have a special retainer. On the circuit the barristers dine together, and none but those who are of the degree of barrister are admitted to the table. The judges, we believe, lodge at a house provided for them exclusively by the county. Judges in all cases in the common law courts, are selected from the sergeants at law, and cannot return to practice at the bar, after having taken a seat upon the bench. The judges, sergeants, barristers and advocates, when in court, wear, by way of distinction, a particular dress. The sergeants, barristers and advocates wear wigs, bands and gowns; and none are allowed to appear in court without these badges of distinction. His majesty's attorney and solicitor general, the sergeants, and king's counsel, and all above the rank of an ordinary barrister, have silk gowns. The sergeants have nothing in their dress to distinguish them from the king's counsel, excepting a black patch of silk on the top of the wig. The judges wear full bottomed wigs and robes of different colours on different days, in term time, and wigs much like those of the sergeants at the sittings at *nisi prius*. Full bottomed wigs are also worn by the barristers, when they appear before the House of Lords. The attorneys, solicitors and proctors, have nothing in their dress to distinguish them from other gentlemen.

In regard to the education requisite to entitle them to practise, that of the attorney and solicitor differs widely from that of the barrister, as that of the proctor does also from that of the advocate. The attorney and solicitor are required to serve a clerkship *bona fide*, under articles of agreement. This service must be during five years, if the candidate have not obtained the honour of bachelor of arts or bachelor of laws, in the universities of Oxford, Cambridge or Dublin, but otherwise, three years' service will be sufficient, if it be within four years of receiving his degree. The whole of this time must be spent in the office of a practising attorney, excepting the last year, which may be spent with a practising barrister, special pleader or conveyancer. The candidate is obliged to give one term's notice of his intended application for admission, and to make affidavit of his service during the time required. Before being sworn and admitted, he is liable to be examined as to his eligibility and capacity by the judge, to whom he makes application, but this is usually dispensed with unless there be opposition. He takes an oath that he will truly and honestly demean himself as an attorney, according to the best of his knowledge and ability; and his name is then enrolled among the attorneys. An attorney who has been sworn, admitted, and enrolled in any of the courts at law at Westminster, may be admitted as a solicitor in any of the courts of equity. And on the other hand a solicitor may be admitted as an attorney in the courts of common law. Attorneys who act as agents of unqualified persons, or permit such persons to use their names, or are guilty of any gross misconduct, are liable to be struck off from the rolls and debarred from practising. And any unqualified person, who shall act as an attorney, is liable to imprisonment not exceeding one year.

As to the education and qualifications requisite in order to be called to the degree of barrister, we cannot state them more concisely than by adopting the language of the common law commissioners.

"The four Inns of Courts,—the Inner Temple, the Middle Temple, Lincoln's Inn, and Gray's Inn,—severally enjoy the privilege of conferring the rank of barrister at law; a rank which constitutes an indispensable qualification for practice in the superior courts. No other means of obtaining that rank exist, but that of becoming enrolled as a student, in one or other of these inns, and afterward applying to its principal officers or benchers, for a call to the bar. The origin of this privilege of the inns of court appears to be involved in considerable obscurity.

"It was observed by lord Mansfield, in the case of The King v. Gray's Inn, Doug. 354, that the original institution of the inns of court no where precisely appears; but it is certain that they are not corporations, and have no charter from the crown. They are voluntary societies, which for ages have submitted to government, analogous to that of other seminaries of learning; but all the power they have concerning the admission to the bar, is delegated to them from the judges; and in every instance their conduct is subject to the control of the judges as visitors.

"In support of these positions, various passages are cited from Dugdale's Origines Juridicales, which clearly show that, in former times, the judges and the benchers made regulations to be observed by the inns of courts, not only respecting the admission to the bar, but generally regarding the conduct of the members of the inn, and the admission of students. Many instances will be found in the appendix, of such orders, sometimes made by advice of the privy council and judges only, and sometimes by the benchers, by advice and direction of the judges, and proceeding from the king's suggestion.

"There does not appear to be an instance in modern times in which the judges have interfered with the internal regulations of the different societies, though there are several in which they have acted as visitors, upon appeals to them from decisions of the benchers respecting calls to the bar.

"In the case of Mr Wooler, reported as the case of The King v. The Benchers of Lincoln's Inn, 4 B. & C. 855, it was held that the judges had no power, as visitors, to interfere with the regulations of the inns of courts respecting the admission of students; and also that the court of king's bench could not, in such case, interfere by mandamus. It was observed by Mr Justice Littledale, "that the court was called upon to control the society in the admission of their members; but that, as far as the admission of members is concerned, those are voluntary societies, not submitting to any government. They may in their discretion admit or not, as they please; and the court of king's bench has no power to compel them to admit any individual." He added, that "the interference of the judges at the instance of those members of the societies whom the benchers had refused to call to the bar, was perfectly right; because a member, who had been suffered to incur expense, with a view to being called to the bar, thereby acquires an inchoate right to be called; and if the benchers refuse to call him, they ought to assign a reason for so doing; and if there be no reason, or an insufficient one, then the member who has acquired such inchoate right is entitled to have that right perfected.

"With respect to the regulations and practice now in force in the different inns of courts, relative to the subjects referred to us under the present inquiry, we find them to be as follows.

"1st. As to the admission of students.

"The following rules appear to have been adopted by all the four societies.

"Before any person can be admitted a member, he must furnish a statement in writing, describing his age, residence, and condition in life, and comprising a certificate of his respectability and fitness to be admitted, which must be signed by the party, and a bencher of the society, or two barristers.

"No person is admitted without the approbation of a bencher, or of the benchers in council assembled.

"The applications must, before he can enter into commons, (and in some societies on admission,) sign a bond with surety conditioned to pay the dues. Every person applying to be admitted a member of any of the Inns must sign a declaration that he is desirous of being admitted for the purpose of being called to the bar, and it is required by all the societies that he shall not, without the special permission of the society, take out any certificate as a special pleader, conveyancer, &c. under 44 G. III. 98, and such permission is not granted until the applicant has kept such commons as are necessary to qualify him to be called to the bar, and it is given for one year only at a time.

"Besides these regulations, we are informed, that at the Inner Temple, and at Gray's Inn, no person is admissible while engaged in trade. It has also been a rule at the Inner Temple, since the year 1829, that no person shall be admitted without a previous examination, by a barrister appointed by the bench for that purpose, in classical attainments and the general subject of a liberal education. Such examination is to include the Greek and Latin languages, or one of them, and such subjects of history and general literature as the examiners may think suited to the age of the applicant.

"2d. As to the call to the bar.

"The following regulations appear to be in force in all the societies. No person in priest's or deacon's orders can be called to the bar. No person can be called to the bar while he is on the roll of attorneys, solicitors, or proctors. Before a person can be called to the bar, he must keep commons for three years, that is, twelve terms, by dining in the hall at least three times in each term. He must have been a member of the Inn for five years, unless he has taken the degree of master of arts, or bachelor of law, at the universities of Oxford, Cambridge, or Dublin, or at Lincoln's Inn, is a member of the faculty of advocates in Scotland, in which case he may be called after he has been a member of the Inn for three years; but this exception does not extend to honorary degrees.

"A student, previously to his keeping any of the terms requisite for his call, must deposit with the treasurer of the society one hundred pounds, to be returned without interest, on his being called to the bar; or in case of death, to his personal representatives; but this rule does not apply to any person who shall produce a certificate of his having kept two years terms in any of the universities of Oxford, Cambridge, or Dublin, or at Lincoln's Inn, of his being a member of the faculty of advocates in Scotland. No person can be called to the bar until he is twenty-one years of age. The call to the bar is by an act of the benchers in council or parliament, &c. assembled. The name and description of every candidate for being called to the bar must be hung up in the hall a fortnight before he is to be called; any person applying to be called to the bar must make application to a master of the bench to move for the same. And the list of applicants to be called to the bar at any society, is always transmitted, before the call takes place, to the other societies.

"At the Inner Temple, Middle Temple and Lincoln's Inn, no attorney, solicitor, or proctor, can be admitted to commons for the purpose of being called to the bar, until his name shall have been struck off the roll.

"In Lincoln's Inn, a person wishing to be called to the bar must read his exercise at the bar table, and the barristers at that table have a power of rejection, subject to an appeal to the benchers. If not rejected by the bar table, it is still necessary that he should be approved by the bench.

"At Lincoln's Inn, it is a rule that no person in trade is permitted to do exercises, to enable him to be called to the bar; and there is the same prohibition as to any person who has been in the situation of clerk to a barrister, conveyancer, special pleader, or chancery draftsman, and has done the offices and received the perquisites of such clerk.

"3d. As to the case of rejection upon an application to be admitted student, or to be called to the bar.

"The general state of practice in all the societies appears to be as follows:

"If a person be refused admission as a student by any of the societies, he has no means, either by appeal to the judges or otherwise, of bringing under revision the propriety of the rejection; (so decided in the case of The King v. Lincoln's Inn, before referred to, which is in accordance with the state of the practice); and a certificate of the rejection is transmitted to all the other societies.

"When any of the societies refuse to call a person to the bar, the benchers will hear him personally or by counsel, and allow him to give evidence to rebut the charges made against him; and if he be dissatisfied with their decision, he may appeal to the judges. On such appeal, the benchers send to the judges a certificate stating the reasons of their refusal to call such person to the bar."

The education of those who intend to practise in the ecclesiastical courts and courts of admiralty, is quite different from that requisite for the attorney, solicitor or barrister.

In order to entitle a person to be admitted as a proctor, it is required that he shall have served a clerkship of seven years under articles with one of the senior proctors, who must be at least of five years standing. And before he is permitted to be articled he must produce a certificate of his having made reasonable progress in classical education. When the term of seven years is completed, the party is admitted a notary by a faculty from the archbishop of Canterbury. A petition is then presented to his Grace, signed by three advocates and three proctors, that the party applying to be admitted has served as articled clerk to a proctor of the court for the full term of seven years. If this certificate be approved, the archbishop issues his *Fiat;* and a commission is directed to the dean of the arches, by whom the party is admitted under the title of a supernumerary with ceremonies similar to those observed on the admission of an advocate.

No person can be admitted to practice as an advocate in the courts of admiralty or ecclesiastical courts, who has not taken the degree of doctor of laws at one of the English universities. This we believe requires at least three years study of the civil and canon law. A candidate for admission as an advocate is required to deliver into the office of the vicar general of the province of Canterbury a certificate of his having taken the degree of doctor of laws, signed by the registrar of the university to which he belongs. A petition, praying that, in consideration of such qualifications the candidate may be admitted, is presented to the archbishop, who issues his *Fiat* for the admission of the applicant directed to the vicar general, who thereupon issues a rescript or commission to be prepared, and addressed to the dean of the arches, empowering and requiring him to admit the candidate as an advocate of that court. To this a proviso is always added that the person to be admitted shall not practise for one whole year from the date of this commission, in order that by attending during that interval he may acquire a competent knowledge of the forms of proceeding in these courts. The candidate is introduced by two advocates, and presented to the dean of the arches, who, after the archbishop's rescript is read and the candidate has taken the oaths, admits him as an advocate of the court. The advocate is afterwards admitted in a similar manner in the court of admiralty.

Having spoken of the Inns of Court and of Doctors' Commons, it may perhaps, as a matter of curiosity, be interesting to our readers to give a succinct account of them. The buildings called Doctors' Commons are near St Paul's cathedral. The ecclesiastical laws, as now existing, have been for upwards of three centuries administered in the principal courts, by the body of men before referred to, as a distinct profession for the practice of the civil and canon laws; some of the members of which body, in the year 1567, purchased the site on which Doctors' Commons now stands, for the residence of the judges and advocates, and proper buildings for holding the ecclesiastical and admiralty courts, where they have ever since continued to be held. In the year 1768, a royal charter was obtained, by virtue of which the then members of the society and their successors were incorporated under the name and title of "The College of Doctors of Law exercent in the Ecclesiastical and Admiralty Courts." This college consists of a president (the dean of the arches for the time being) and those doctors of law, who, having regularly taken that degree in either of the universities of Oxford or Cambridge, and having been admitted advocates in pursuance of the rescript of the archbishop of Canterbury, shall have been elected fellows of the colleges in the manner prescribed by the charter. The judges, advocates and proctors have their offices of business and places of residence at Doctors' Commons.

As to the Inns of Court, they are of so very great antiquity that their origin is now involved in some doubt. It has been generally supposed that they originated in a struggle between the church, governed by and cultivating the study of the civil and canon law, and the nobility, gentry, and others, anxious to maintain and cultivate the profession of the English common law. When the court of common pleas, the only court at that time having jurisdiction in civil cases, was, by *Magna Charta*, established permanently at Westminster, it is supposed, that many lawyers theretofore dispersed in various parts of the country, began to have fixed residences near this court; and that about this time the professors of the common law being excluded from the universities, for the purpose of establishing the study of the common law without the aid of the church, formed themselves into voluntary societies and a collegiate order, and established a sort of university of their own, which at different times was favoured with the countenance and support of the crown.

There are, at present, four Inns of Court, the names of which have before been mentioned; and several Inns of Chancery, belonging respectively to these Inns of Court. The former are occupied by barristers and students, and the latter by attorneys, solicitors and their clerks. Fortescue, speaking of these Inns in his time, says that the laws of England being learned and practised in three different languages, namely, English, Norman French, and Latin, could not be so well studied in the universities where Latin was mostly in use; but were studied in a public manner and place, much more commodious and proper for the purpose, than in any university; that the situation of the place was between London and Westminster, and not in the heart of the city itself, where the great confluence and multitude of the inhabitants might disturb them in their studies, but in a private place, separate and distinct by itself in the suburbs, nearer to the courts of justice, that the students, at their leisure, might daily and duly attend with the greatest ease and convenience. The Inns of Court, although they remain in the same place as in the days of Fortescue, are now in the midst of the business and bustle of the town. Fortescue says, that the students in the Inns of Chancery, of which Inns there were ten or more in his time, were young men, who studied there the first principles of the law; and that after having made some progress there, and being more advanced in years, they were admitted into the Inns of Court. In these greater Inns, he says a student could not well be maintained under eighty scuta, (a very large sum in those days), and if he had a servant to wait upon him, as for the most part they had, the expense was proportionably more, and that for that reason, the students were sons of persons of quality; those of an inferior rank not being able to bear the expense of maintaining and educating their children in that way. And as to the merchants, he says they seldom cared to lessen their stock in trade by being at such large yearly expenses. So that there was scarcely to be found throughout the kingdom, an eminent lawyer, who was not a gentleman by birth and fortune, and consequently, they had a greater regard for their character and honour than those who were bred in another way. There was in the Inns of Court and Inns of Chancery, a sort of academy or gymnasium, fit for persons of their station, where they learned singing and all kinds of music, dancing and such other accomplishments and diversions, as were suitable to their quality and usually practised at court. At other times, out of term, the greater part applied themselves to the study of the law. Upon festival days, and after the offices of the church were over, they employed themselves in the study of sacred and profane history. There, says our author, every thing good and virtuous was to be learned, and all vice was discouraged and banished; so that knights, barons and the greatest nobility of the kingdom, often placed their children in those Inns of Court, not so much to make the law their study, much less to live by the profession, (having large patrimonies of their own,) as to form their manners and to preserve them from the contagion of vice.

These Inns for a long time after the days of Fortescue bore a very strong resemblance to universities. They conferred their degrees of apprentice, or barrister and sergeant at law, answering to the degrees of bachelor and doctor of law conferred in the universities. There were lectures or readings which the students attended. Prayers were daily read in the chapels belonging to the Inns. Questions were daily mooted. The students constantly lodged there, and dined and supped in the halls of the Inns in vacation, as well as in term time. The Inns were impaled and the gates were closed at a certain hour in the evening, and opened at a certain hour in the morning, in like manner as at the universities. Each Inn had rules and regulations regarding the conduct of the students much like those at the universities. And the members were accountable to the heads of their Inns for their conduct, with as much strictness as the students at Oxford or Cambridge are now.

Lord Coke says, speaking in reference to his time, "As there be in the universities of Cambridge and Oxford divers degrees of general sophisters, bachelors, masters, doctors, of whom be chosen men for eminent and judicial places both in the church and ecclesiastical courts, so in the profession of the law, there are mootmen, which are those that argue readers' cases in Houses of Chancery, both in terms and grand vacation. Of mootmen, after eight years study or thereabouts are chosen utterbarristers. Of these are chosen readers in Inns of Chancery. Of utterbarristers, after they have been of that degree twelve years at least are chosen benchers or ancients; of which one that is of the puisne sort reads yearly in the summer vacation, and is called a single reader, and one of the ancients that had formerly read, reads in Lent vacation, and is called a double reader, and commonly it is between his first and second reading, about nine or ten years. And out of these the king makes choice of his attorney and solicitor general, his attorney of the court of wards and liveries, and attorney of the duchy, and of these readers are sergeants elected by the king, and are by the king's court called *ad statum et gradum servientis ad legem;* and out of these the king electeth one or two or three as please him, to be his sergeants, which are called king's sergeants. Of sergeants are by the king also constituted the honourable and reverend judges and sages of the law. For the young student, which most commonly cometh from one of the universities for his entrance or beginning, were first instituted and erected eight houses of Chancery to learn there the elements of the law, that is to say, Clifford's Inn, Lyon's Inn, Clement's Inn, Barnard's Inn, Staple's Inn, Furnival's Inn, Thavie's Inn, and New Inn, and each of these houses consist of forty or thereabouts. For the readers, utterbarristers, mootmen, and inferior students, are four famous and renowned colleges, or houses of court, called the Inner Temple, to which the first three houses of chancery appertain, Gray's Inn, to which the next two belong, Lincoln's Inn, which enjoyeth the last two but one, the Middle Temple which hath only the last. Each of the houses of Court consists of readers above twenty, of utterbarristers about thrice so many, of young gentlemen about the number of eight or nine score, who there spend their time in study of law, and in commendable exercises fit for gentlemen. The judges of the law and sergeants being commonly above the number of twenty, are equally distinguished into two higher and more eminent houses called Sergeant's Inn. All these are not far distant from one another, and altogether do make the most famous university for profession of law only that is in the world, and advanceth itself above all others, *quantum inter viberna cupressus.*"

It would seem, notwithstanding the magniloquence of lord Coke, that the study of the law in these Inns had, even in his time, in some degree degenerated since the days of Fortescue. Two of the Inns of Chancery certainly, if no more, had become extinct, and in each of those remaining there were only about forty students, whereas, in Fortescue's time there were in each at least one hundred. And in comparing the ancient lectures or readings, with those in his day, lord Coke in another place says, "now readings having lost their former qualities, have lost also their former authorities; for now the cases are long, obscure and intricate, full of new conceits like rather to riddles than lectures, which, when they are opened, vanish away like smoke, and the readers are like lapwings who seem to be nearer their nests when they are farthest from them." The diminution of the number of students may probably have been occasioned by the circumstance that the sons of the nobility, not particularly destined for the profession of the law, did not resort there in so great numbers as formerly for the purpose of completing their education. The Inns were still, however, even at this time, the residence of some of the sons of the nobility, and men of family and fortune; and being intended, as the order of the readers and benchers declares, "chiefly for the profession of the law, and in a second degree for the education of the sons and youth of riper years of the nobility and gentry of the realm," it is but reasonable to suppose that lighter and more attractive studies and pursuits, and "commendable exercises fit for gentlemen," as lord Coke denominates them, often took the place of the dry and less inviting learning of the law. Sir Christopher Hatton first gained the favour of royalty by appearing in a mask made by lawyers; even Saunders excelled on the harpsichord; lord-keeper Guilford, besides being skilled in the modern languages and painting, was a scientific and practical musician, and composed pieces of music after he was honoured with a seat on the bench; Sir John Davis wrote a poem in lyric verse, on the antiquity and excellence of dancing; and lord Bacon composed an essay on the subject of masks. Many curious and amusing details are given by ancient writers of the customs and usages of these Inns in former times. They had their revels, their romantic festivals, their grand christmasings, their masquerades, their banqueting nights, their splendid pageants, and their pastimes and amusements of various kinds, in which the judges, sergeants at law and barristers often participated. "They sang, they danced, they made merry, and on their days of license their 'lords of misrule,' 'jack straws,' and 'kings of the cockneys' made their halls ring with festivity."

But the times have undergone a great change, and the course of education has changed with them. Few only of the ancient customs or ceremonies remain. Their feastings on grand occasions, their splendid pageants, their former pastimes and amusements, have long since been discontinued, and are known only to the antiquarian. Their readings, mootings, lecturings and other like exercises, have shared the same fate. Residence is no longer required, and consequently prayers are no longer daily read in the chapels; dining in the halls in vacation and supping has ceased; and scarcely any thing remains but what is alluded to in that part of the report of the common law commissioners which we have already quoted. But the rank and character which the profession of the law sustains in the community, has not perhaps been very materially affected by these changes. It has still enrolled among its members some of the younger branches of the nobility, and scions of the most distinguished families in the country, although it is principally composed of the upper ranks of the middle classes, and has nevertheless many among its members who have by force of their talent and industry, struggled up from the lower classes in society. A barrister is still considered as a fit companion for the greatest nobleman in the realm, and those who have been members of the profession, are usually among the most distinguished in both houses of parliament and of his majesty's counsel.

In term time the benchers, barristers, and students, still continue to dine in the halls of the respective Inns of Court. They are not allowed to appear on these occasions without their gowns. The halls are much like those in the colleges at the universities of Oxford and Cambridge. The arms of their treasurer are painted on the windows, and portraits of their distinguished men are hung upon the walls. The barristers and students sit at the tables running along lengthwise of the hall; and the benchers sit at an elevated cross table at the upper end of the hall. The names of those dining in the hall are taken down by the steward every day during term in a book kept for the purpose. No one who dines in the hall can leave till grace has been said after dinner. The fare of the benchers is more sumptuous than that of the barristers and students. After dinner the benchers retire to their private room to drink their wine and partake of the dessert provided for them, in like manner as do the masters and fellows in the colleges at the universities. Here the candidates for admission to the degree of barrister are introduced in gowns and with bands, on the occasion of being called to the bar. The ceremony is as follows. The customary oaths are taken, after which one of the benchers declares to the candidates that the benchers have determined to call them to the bar and congratulates them on the occasion, and usually drinks their health, for which they return thanks and then retire. They take the same oaths again at Westminster Hall, and thereupon are admitted to practice. The number of the benchers is limited, and vacancies are from time to time supplied by election made by themselves. King's counsel, however, become *virtute officii* benchers of the Inn to which they belong. In regard to the practice of dining in the halls in term time, so far as it regards students, the common law commissioners say, "We conceive that that part of the present system of all the societies, by which students, in whatever part of the kingdom they may be resident, are required to dine in the common hall, a few days in the course of every term, is founded on just views and attended with beneficial effects. Amongst these may be noticed that of its making known the person of the student and exposing him, if his character be disreputable, to more easy detection by the society before the period of his application to be called to the bar. It also gives an opportunity of attending the courts, and associating with students and other members of the profession."

The chambers in the Inns of Court, we believe, are let, either from year to year, or for three lives; and each of the Inns of Court has a very large annual income arising from the rents of its estates and otherwise. The income of the Inns has been estimated, but with what accuracy we know not, at sixty thousand pounds sterling. Many complaints have been made recently and since the attention of the public has been particularly called to the subject, not only that this income is not so well employed as it is imagined that it might be, but that many of the rules and regulations of these societies relative to the admission and education of students and barristers, are not such as ought to regulate the education and admission to a profession occupying a most prominent and important rank in the civil institutions of the country.

Some of these are noticed by the common law commissioners as being in their opinion objectionable. And in their report they recommend that ·ther by act of parliament, or by authority of his majesty in council, the societies be enjoined to allow, and the judges of the courts at Westminster to receive, an appeal from any acts of the benchers of any of the Inns of Court rejecting an application for admission into their society; and that it should be established by way of positive regulation that in all cases where an application is rejected, whether it relates to admission as a student, or to the call to the bar, the party applying shall have notice in writing of the cause of rejection,—shall be allowed to clear himself from any charge of misconduct which it may involve, and for that purpose shall be at liberty to make his defence either in person or by counsel, and to produce evidence, and that a full report of the whole evidence and other proceedings before the benchers, shall in the event of an appeal, be laid before the judges. They further recommend, that it should be ordained that no general rules, or orders in future, to be made by any of the societies on the subject of admission of students, or call to the bar, shall be of any force until they shall have been laid before all the judges of the superior courts at Westminster, to be assembled for this purpose, and approved and subscribed by such judges, or eight or more of them, which they remark would be a partial return to the ancient practice. They also express an opinion that the rule requiring special pleaders and conveyancers to obtain a license from the societies to practice is objectionable. They propose that the certificate of two graduated members of any of the universities, or of two respectable householders, should suffice instead of the recommendation of one bencher or two barristers, when candidates are proposed for admission to the societies; and that in all the Inns of Courts the power of admitting or rejecting an applicant for call to the bar should in future be vested in the benchers only. With respect to the existing rules of the Inns of Court subject to these exceptions, the commissioners report that they appear to them to be free from objections.

Notwithstanding the apparently objectionable features of the rules and regulations of these Inns of Court, so far as they relate merely to the admission of students, or to the calling them to the bar, yet such is the character of the body invested with discretion in this regard, namely, the benchers, who are men at the head of their profession, and most of them far advanced in years, and such of course has been the manner in which this discretion has been exercised, that, from the earliest times, there have been very few cases of complaint, and even in those, from the best accounts we have of them, there is hardly room for a doubt of the correctness of the decision of the benchers.

LAWRENCE, John, author of a treatise on the Horse, and other practical works, died at Park Place, Peckham, April 17, 1839, aged eighty-six. He was, in early life, one of the first advocates of legislative enactments for the suppression of cruelty to animals; and his writings were of eminent assistance towards obtaining those acts of parliament which were passed for their protection. The following is a list of Mr Lawrence's works:—"A Philosophical and Practical Treatise on Horses, and on the Moral Duties of Man towards the Brute Creation. Account of former Writers—Management and Medicine—Shoeing—Purchase and Sale," &c. Two vols. 8vo. Three editions. "The New Farmer's Calendar. Practical Husbandry—the Row Culture—Diseases of Vegetables—Live Stock—Poultry, &c." Five editions. "The Modern Land Steward." Two editions. "A General Treatise on Cattle—the Ox, the Sheep, and the Swine—Management—Breeding, and Medicine." Two editions. "A History of the Horse, and delineation of the Race Horse. The Breeding Stud—Breaking—Training, &c." 4to. plates. "A Treatise on Domestic Poultry, Pheasants, Pigeons, Rabbits, Swine, and Dairy Cows." Five editions. 12mo. Published under the assumed name of "Moubray." "British Field Sports. Game Laws — Shooting — Hunting — Coursing—Racing—Hawking—Cocking—Fishing, &c." 8vo. Under the name of W. H. Scott. "The Sportsman's Repository. History, descriptions, and instructions relative to Horses and Dogs." Also under the name of W. H. Scott. "The descriptions of Alkin's (folio) Sporting Plates, with a French Translation." Two editions. 4to. With additions. "The Horse—in all his varieties and uses—with rules for his preservation from disease." Small 8vo. 1829.

LEACH, Sir John, late master of the rolls, was born in the town of Bedford, in 1760, where his father was a tradesman. He was educated at the grammar school there, and placed in the office of Sir Robert Taylor, the eminent architect, to whose business he applied himself with great attention and perseverance. He afterwards, however, commenced the study of the law, and entered himself at the Middle Temple on the 26th of January, 1785, and became the pupil of that eminent draftsman and judge, Sir William Alexander, then in great practice as a junior equity counsel. In Hilary term, 1790, he was called to the bar by that society, and chose the home circuit and Surrey sessions. He soon obtained considerable practice in these courts, and was distinguished for his neat, accurate, and forcible speeches, his pleasing and lucid statements of cases. The first important matter in which he was retained as counsel was the Seaford election, both at the election, and on the subsequent petition against it; being his first connection with that borough, which he afterwards represented in parliament. In 1800 he began to confine himself to equity practice; and although this important step did not at once meet full encouragement, no very long period elapsed ere he became extensively employed. He was particularly celebrated for his able and correct pleadings in equity; they are, in fact, the foundation of many of the private MS. collections of value now in the profession. Some of them, marked J. L., have been printed in the collection by Mr Van Heythusen, and they have long been valued and followed by the practising equity draftsmen of the present day. His capabilities as a lawyer were, however, by no means confined to his chambers. In court he rose rapidly into eminence, combining very considerable learning with great powers of arranging and condensing facts. His speeches always enforced attention, being clear, precise, and nervous. He contended often pre-eminently, even with Sir Samuel Romilly, and was generally preferred to Sir Anthony Hart, to both of whom he was constantly opposed, more especially when he became King's counsel. His temper was warm and irritable, and he was frequently involved in personal altercation with the advocate to whom he was opposed. His talents as a speaker not only secured his employment in the equity courts, but gained him considerable business at the Cock-pit, more particularly on West India appeals. He was, moreover, distinguished for his despatch and powers of disposing of his business. In politics, although he never took a very active part, he was a Whig, and was early introduced to the leaders of that party,—Mr Fox, Mr Sheridan, and others. In 1807, he took a more distinguished stand, both in his profession and before the public. He had ever since 1792 been more or less connected with Seaford. In 1795 he had been elected recorder; and having resided and purchased property in the place, he had by degrees obtained sufficient influence in the borough to return both its members in the general elections in 1806 and 1807. In the election in 1807, he himself was returned for that borough, and voted with the Whig administration. In 1811 he spoke in favour of the regency bill, and thought it advisable to print his speech; and from this time the favours of the court flowed in upon him. He was consulted by the prince of Wales as to the propriety of issuing a commission to Italy respecting the conduct of the princess of Wales; and in 1817 he succeeded Sir Thomas Plumer as vice-chancellor, and was knighted. His appointment was on the whole considered a proper one, and gave satisfaction to the profession. In May, 1827, he succeeded Sir John Copley as master of the rolls, on his acceptance of the great seal. He held the office of master of the rolls until his death, which happened at Edinburgh, on September 16th, 1834, on his road to visit the duchess of Sutherland. His most remarkable qualities as a judge, were his power of seizing on the important points in every case that came before him, and in his being able to deliver his opinion on them immediately, in a manner the most clear and precise. It sometimes, however, happened that he saw not all the bearings of it at the same moment, and, therefore, was liable to give a general judgment on merely particular, and sometimes even insufficient grounds. His decisions were not those that left either party simply content with them. They were so clear as to convince a man in spite of his interests, or they were so doubtful, from the cause already mentioned, that they were instantly appealed against. A more quiet and cautious judge, with the undoubted ability and talent of Sir John Leach, would have had fewer of his decisions appealed from; but then, when he was right, he would have given less complete and unanswerable reasons for the opinions he adopted. There can be little doubt, that the unfortunate state of Sir John Leach's health, working upon an excitable temperament, sometimes led him to take hasty and one-sided views of the cases brought before him, and to cling to his first impressions with the most determined resolution. This was his misfortune, while the merit of talent and the greater praise of learned industry, may be set off against it; and, however the circumstances of his health might sometimes affect his temper, the praise not merely of impartiality but of an earnest desire to do complete and equal justice most undoubtedly belonged to him.

LEACH, William Elford, M.D., F.R.S., one of the most laborious and successful, as well as one of the most universal, cultivators of zoology which this country has ever produced; died in Italy of cholera in 1836. His discoveries in the different classes of the vertebrata, especially birds, were extensive; but it was in entomology and malacology that his labours have been most known, and his improvements of the greatest importance. His knowledge of the crustacea was superior to that of any other naturalist of his time, and his arrangement the best, until the work of Dr Milne Edwards appeared. After a long suspension of his studies from ill health, during which, and up to the period of his death, he was attended by the most devoted of sisters, he returned to his favourite occupation with his habitual ardour; and the letters he wrote to his scientific friends in this country exhibited the same devotion to the study of nature which distinguished the brighter years of his life. His principal work, "The Natural History of the Mollusca of Great Britain," in the possession of his friend Mr Bell, is not yet published. His other works were: "Malacostraca Podolphthalma Britanniæ," 4to, 1815 and 1816, not finished; "Zoological Miscellany," 3 vols. 8vo. 1817; "On the Genera and Species of Proboscideous Insects," 8vo. 1817. He described the animals taken by Cranch in the expedition of Capt. Tuckey to the Congo; and was the author of valuable articles in the Encyclopædia Britannica, Edinburgh Encyclopædia, Philosophical Transactions, Zoological Journal, Memoirs of the Wernerian Society, Dictionnaire des Sciences Naturelles, &c. Between 1810 and 1820, he contributed seven papers to the Transactions of the Linnæan Society: three on Insects; a general arrangement of the Crustacea, Myriapoda, and Arachnides, a very laborious work; two descriptive of ten new genera of Bats; one on three new species of Glareola.

LEADHILLS; a village of Scotland, in the upper ward of Lanarkshire, long celebrated for its lead mines. It is situated 1280 feet above the level of the sea, being the most elevated part of the south of Scotland, and the mineral treasures the hills afford have occasioned the concourse of miners, and the establishment of this and the neighbouring village of Wanlockhead.

According to common report, the lead mines were discovered by a German of the name of Bulmer, when searching for gold in the banks of the adjoining rivulets. This account is extremely probable; for the numerous hillocks on the banks of the streams which discharge themselves into the Clyde and Nith, bear evident indications of having been thoroughly searched for that precious metal: even so much so that those miners who at present amuse themselves during their leisure hours, in searching for gold, cannot find a spot that has not previously been explored.

The method of searching for gold adopted at Leadhills is as follows: the surface of the rock is laid bare; the earth, sand, &c., in its crevices, are collected, riddled, and washed. The water carries away the earthy particles, and leaves those materials which are of greater specific gravity than itself, as flint, quartz, and what gold there may be. The proceeds from one puddle, as it is called, are generally, at the most, not more than a few particles, not larger than the point of a pin; but a man in six hours, at an average, may collect about four pennyworth of gold. Some pieces, however, have been found as large as a pea, or small bean. These gold mines, however, were once productive; for history informs us that in the reign of James V. of Scotland, three hundred men were employed in them; and when that monarch, in a hunting excursion in the adjacent moors, dined in Crawford castle, each of his retainers, for dessert after dinner, was presented, on a wooden platter, with a few bonnets crowns, as the produce of the soil. These pieces were coined from gold obtained in the mines of Glengonar, the rivulet upon which Leadhills is now built.

Lead, however, for centuries, has formed the mineral riches of these mines. The vein has more than once expanded to the enormous width of fourteen feet; but seldom exceeds more than four and a half feet, and this was considered by the miners as a very good lead. At present the crip, or annual number of bars, (of 144 pounds each,) amounts to 10,000 in Leadhills, and to about 8000 in Wanlockhead; whereas at one period 35,000 were made at the former, and 15,000 at the latter.

The population of the village of Leadhills is upwards of 1200. Of these 300 are working miners, smelters, washers and labourers; the rest consist of women, children, and old men. The miners here have been long noted for intelligence. So early as 1741 a library was established among them by Mr James Stirling their overseer, and it now numbers above 2000 volumes. They possess other advantages, in only working six hours in the twenty-four, and being allowed by their landlords, the earl of Hopeton and duke of Buccleugh, as much land as they can work with the spade. Allan Ramsay was a native of Leadhills.

LEAMINGTON; a village in Warwickshire, which, since the beginning of the present century, has become a fashionable watering place. The mineral waters to be found here are valued on account of their efficacy in the cure of cutaneous diseases, glandular obstructions, bilious and dyspeptic complaints, &c., for which they are used both internally and externally. The original spa contains a large proportion of common salt, besides sulphate of soda, muriate of magnesia, and sulphate of lime; and there are also chalybeate and sulphureous springs, the latter of which being chiefly used externally. A bridge over the river Leam connects the new town with the original village, and on both sides of the river are many houses well built and elegantly furnished for visitors. Population of parish of Leamington in 1841 12,864.

LEIGH. There are a number of parishes and chapelries in England with this name, the most important of which is that of West Leigh in the county of Lancaster. It is situated conveniently for water communication, and is one of the busy districts of Lancashire manufactures. It includes the townships of West Leigh and Pennington. Muslins, cambrics, calicoes, and fustians, are the principal articles here manufactured; several new commercial establishments have taken place in and near the town of late years; and the numerous population of the parish appears to have been greatly augmented. Here are coal-mines, and likewise lime-pits, which furnish a valuable kind of limestone, the lime from which has the property of hardening under water. Leigh was the residence of Thomas Highs, the inventor of the water-frame, which served as the basis of Arkwright's improvements in cotton-spinning. Population in 1841, 6838.

LEOMINSTER; a town in Herefordshire, situated on the river Wye, 137 miles W.N.W. from London. The buildings in the outskirts of the town are very indifferent, and many of the streets are narrow and inconvenient; but the High street is spacious, and contains many modern edifices of a respectable appearance; and the situation of the place as a thoroughfare on the great road from London to South Wales has occasioned the erection of several good inns. The town-hall, or, as it is commonly called the butter-cross, is a singular structure of plaster and timber-work, erected in 1633, by John Abel, a noted architect of that period. It stands on twelve oak pillars, with a kind of Ionic capital, and sustained by stone pedestals the brackets and spandrels above the arches, and the upper parts of the building are profusely ornamented with carving. The principal manufactures carried on here formerly were those of woollen cloth, hats, and gloves; but the last-mentioned is declining, and the others have almost disappeared; among the existing branches of industry are flax-dressing, rope-making, tanning, malting, and nail-making. Population of the burgh and parish in 1841, 4916.

LEOPOLD, CHARLES WILLIAM, Secretary of State in Sweden, and member of various learned societies, was born at Stockholm, on the 2nd of April, 1756. His father was comptroller of the customs there, but as his income was very limited, he had not the means of giving that education to his son which the latter was anxious for. He was indebted to the kindness of a learned French teacher, who had remarked his good disposition, and took pains to instruct him in French, so successfully that in no long time he knew it as thoroughly as he did his mother tongue. This first part of his education had a material influence on his future studies, as well as on his fortune through life. In 1773 he entered the university of Upsal, where he published a Latin Thesis, *De origine idearum moralium*. In 1778 he published an ode on the birth of the prince royal, Gustavus Adolphus, which was criticised by Kellgren, and led to an intimacy between the poet and the critic. As Leopold was obliged to earn by his labours the means of continuing his studies, he was sometimes obliged to interrupt them. By dint of savings he at last realized a small sum, which enabled him to repair to the university of Greifswald, where he took his degree of doctor of philosophy in 1781. He returned to Sweden in 1784, and the learned Liden committed to him the care and superintendance of the library which he had presented to the university of Upsal. Through the interest of two of his noble friends, baron Erenheim and count de Creutz, he was introduced to the notice of the king, Gustavus III., who invited him to Stockholm, gave him an apartment in the palace, and a sum of money to pay his debts. In 1786 the king founded the Swedish academy, and named thirteen members, who were to appoint the other five to complete "the eighteen." Leopold was one of these five. In 1788 he had the charge of the royal library of Drotningholm, and in 1778 became the king's private secretary. Leopold accompanied his Majesty in his campaign against the Russians, and wrote odes on his victories, and verses on his defeats. In 1790 his tragedy of Odin was brought out at the theatre of Stockholm, when the king sent him a diamond ring, and two laurel leaves gathered at the tomb of Virgil. At the end of the same year he married Miss Ferman, daughter of a Danish counseller of justice, a lady of great beauty and accomplishments, and deeply conversant with French literature. The death of the king was a great blow to Leopold's fortunes. Shortly after that event the Swedish academy was suppressed by the ministry, and Leopold removed from the capital, to which he did not return until the academy was re-established by Gustavus Adolphus IV., who made him amends for the long obscurity in which he had been left by the flattering distinctions conferred upon him. After the deposition of Gustavus, and the change of dynasty which succeeded, he continued to be treated with equal favour. The last ten years of his life were very melancholy. After suffering greatly for nearly three years, he became totally blind; and nearly about the same time his wife became insane, and continued so till the third of May, 1829, when she died. Her husband survived her just six months, he dying on the 3d Nov. 1829. Leopold was considered as at the head of the French school of literature in Sweden—a school now nearly exploded in that country.

LEWES; a town in the county of Sussex, situated on the right bank of the Ouse, forty-nine miles S. by E. from London. It is a place of great antiquity; and still retains the remains of an ancient fortress. The borough has returned two members of parliament since the reign of Edward I., a privilege which the Reform Bill continues. The principal manufacture now carried on here is that of paper: on the banks of the Ouse are some cast-iron founderies. The trade in wool was formerly extensive, but grain and malt, sheep and cattle, are now the chief articles of traffic. The river is navigable for barges to Newhaven. The county assizes are held at Lewes. Population in 1841, 32,377.

LIBRARIES, (*a*.) The contents of the public libraries of Europe, which amount to between seven or eight hundred, have been estimated by Malthus at 19,847,000 volumes. Of these there are in

Germany	Austrian States	2,220,000	6,741,000
	Prussian do.	997,000	
	Other German States	3,524,000	
France			6,427,000
Italy			3,139,000
Great Britain			1,533,000
Russian Empire			880,000
			18,720,000

M. Adrien Balbi gives a tabular view of twenty-nine of the largest libraries in the world; and he also presents a variety of the different statements of different writers, respecting the number of volumes contained in some of the principal libraries in Europe, with some remarks on the difficulty of obtaining authentic and correct information on the subject. With respect to different modes of computing the number of volumes in a library, he says:—"One author counts only the printed books; to these another adds the number of manuscripts; a third reduces to a certain number of volumes the dissertations, pamphlets, and fugitive pieces, which are preserved in a separate form, or bound in volumes, and which were entirely excluded by the first from the enumeration; a fourth adds by the same process a certain number of volumes for the engravings, maps, and designs, which are not comprised in the printed volumes which they accompany; and a fifth regarding as so many volumes all the dissertations, pamphlets, and fugitive pieces, thinks proper to add their number to that of the printed books contained in the library, the number of volumes of which he thus increases in an extraordinary manner."

Table of the Largest Libraries in the World, Ancient and Modern, from M. Balbi.

	Vls. pr.	MSS.
Paris, *Royal*	626,000	80,000
Munich, *Royal*	540,000	16,000
St Petersburg, *Imperial*	432,000	15,000?
Copenhagen, *Royal*	410,000	16,000?
Vienna, *Imperial*	284,000	16,000
Berlin, *Royal*	280,000	5,000
Pekin, *Imperial*	280,000	
Dresden, *Royal*	260,000	2,700
Gottingen, *University*	250,000	5,000
London, *British Museum*	220,000	22,000
Oxford, *Bodleian*	200,000	25,000
Wolfenbuttel, *Ducal,*	200,000?	4,500
Madrid, *Royal*	200,000	2,500?
Paris, *Arsenal*	186,000	5,000
Stuttgard, *Royal*	174,000	1,800
Milan, *Brera*	169,000	1,000
Naples, *Museum*	165,000	3,000
Florence, *Magliabechian*	150,000	12,000
Breslau, *University*	150,000	2,300
Munich, *University*	150,000	2,000?
Edinburgh, *Advocates'*	150,000	6,000
Jeddo,	150,000?	
Miaco,	150,000?	
Alexandria, *Ptolemy's*	110,000?	
Tripoli in Syria, *of the Kadis*	110,000?	
Cairo, *Caliphs'*	110,000?	
Alexandria, *burnt by Arabs*	100,000?	
Rome, *Ulpian*	100,000?	
Cordova, *Caliphs'*	100,000?	

The number of volumes in most of the above libraries is stated by some writers as considerably greater; by others, as smaller; but the above statements are such as M. Balbi thinks most to be relied on. With respect to the number of volumes contained in the several ancient libraries above enumerated, there is great uncertainty: and it is difficult to fix upon any satisfactory method of computing them.

In the "Gentleman's Magazine," for January, 1836, the Bodleian Library is stated to contain 420,000 volumes; and the Library of the British

Museum 305,000; and in the "Monthly Review," for May, 1836, in a notice of a "Report from a select committee on the condition, management, and affairs of the British Museum," it is stated to "contain 218,950 printed volumes, 21,604 volumes of manuscripts, and 19,093 charters." M. Balbi gives several statements of the number of volumes in the Bodleian Library, which vary from 130,000 volumes to 700,000 volumes and 30,000 manuscripts.

With respect to the number of volumes contained in the Vatican Library at Rome, there is a singular disagreement among the different authorities. The following statement from various authorities is furnished by M. Balbi:—

	Volumes.		Manuscripts.
Rampoldi	90,000	more than	45,000
Malchus	160,000		
Bisinger	160,000		
La Revue Britannique (1802)	400,000		50,000
Bailly, (1827)	400,000		50,000
D'Haussez	800,000		38.000
Eustace	from 200,000 to 1,000,000		50,000

M. Balbi in his *Essai Statistique sur le Royaume de Portugal*, published in 1822, stated the contents of the Vatican Library as follows;—printed volumes 60,000; manuscripts 60,000? And in his more recent work on libraries he remarks:—"What shall we say of the ridiculous, not to say absurd, exaggerations which are found in works justly celebrated, respecting the number of volumes in the Vatican Library at Rome, and the Bodleian Library at Oxford?—With respect to the Vatican Library, we do not blush to confess, that, led into error by imposing authorities, we exaggerated the number of manuscripts, although the point of interrogation which accompanied the number, sufficiently indicated our doubts. As, since then, the library of an illustrious *littérateur*, whose recent death Italy laments, that of the count Leopold Cicognara, has added nearly 10,000 printed volumes to the Vatican, we believe that one may now carry the actual number to nearly 75,000; and we reduce to about 35,000 the number of manuscripts." Yet Mr Eustace in his "Classical Tour through Italy," says of this library;—"The number of volumes has never been accurately stated; some confine it to 200,000, others raise it to 400,000, and many swell it to 1,000,000." The London "Quarterly Review," in 1826, says;—"The library of the Vatican is the most considerable in the world;" and the London "Foreign Quarterly Review," for April, 1836, says;—The Imperial Library (at Vienna) which contains about 300,000 volumes, acknowledges but three equals in Europe, that of the Vatican at Rome, and the Royal Libraries at Paris and Munich."

Contents of the Royal Library at Paris in 1822.

Volumes of every description			450,000
450,000 pamphlets and fugitive pieces,—equal to vols.			45.000
1,200,000 maps, diplomas, &c.	—	—	24,000
80,000 manuscripts	—	—	80,000
1,200,000 engravings, prints, &c.	—	—	6,000
			605,000

Since 1822, this library, according to M. Balbi, has been increased at the rate of upwards of 8,000 volumes a year.

Contents of the Imperial Library at Vienna.

Volumes printed since the year 1500	270,000
Volumes of *Incunables* (i.e. printed in the 15th century)	12,000
Manuscripts	16,016
Volumes, Portfolios, &c. forming a collection of Maps	1,242
	299,258

M. Balbi enumerates forty-two libraries in Vienna, which altogether contain 1,143,000 volumes.

Public Collections of Maps.

		Number of Pieces.
Paris, (Cabinet of Maps,)	more than	1,400,000
Munich,	do.	300,000
Vienna	about	300,000
Dresden	do.	250,000
London, (British Museum)	do.	100,000
Copenhagen	do.	80,000
Amsterdam	do.	70,000

M. Balbi states the annual endowment or expenditure of several of the European Libraries, as follows:

	Francs.		Francs.
Bodleian, Oxford,	75,000	Royal, Copenhagen,	22,640
Imperial, Vienna,	47,500	University, Gottingen,	20,000
Royal, Berlin,	29,680	Royal Madrid,	14,000
Advocates', Edinburgh,	25,000	Royal, Dresden,	10,000

Libraries are generally of slow growth, and a long series of ages has been required for the accumulation of the large ones enumerated in the preceding table. The largest libraries in the United States of America are comparatively small. That country is, indeed, too young to enter into a competition of this kind with the countries of Europe; yet, since the commencement of the present century, public libraries there have greatly increased in number and size.

LISBURN, (originally *Lisnegarvey*,) a handsome and thriving town in the county of Antrim, Ireland, situated on the north-western bank of the river Lagan, which separates Antrim from Down, and on the high road from Dublin to Belfast; distant from Dublin ninety-three miles N.; from Belfast, nine S. W. by S. A small suburb on the opposite side of the river is now included within the limits of the burgh. Lisburn carries on a considerable trade in the various branches of linen and cambric manufactures. The diapers and damasks of the place are greatly valued for their fineness of texture. The establishment of a number of French refugees in this town after the revocation of the edict of Nantz, was attended with the happiest consequences to the character of these fabrics, a reputation preserved in the commercial world to this day. In the neighbourhood are extensive establishments for printing, bleaching, and dyeing. The general retail trade of the town is extensive. On market-days, (Tuesdays) large sales are made of provisions, agricultural produce, linens, &c. The church of Lisburn, which was erected into a cathedral for the united sees of Down and Connor, by patent, dated October 22, 1662, is a spacious edifice, adorned with a steeple and spire. The market-house is also ornamented, being enlivened by the erection of a steeple and cupola, and the rooms in the interior have been fitted up at the expense of the marquis of Hertford. Here are also meeting-houses of Presbyterians, Quakers, Methodists, &c., besides a handsome Roman Catholic chapel. In the reign of James I. Sir Fulk Conway obtained a grant of this place, and colonised it with a number of Welsh families. The town then erected was upon a regular plan. In 1641, Sir George Rawden defeated the rebel army here; and in 1662, the inhabitants received a patent, empowering them to return two members to parliament in consideration of their loyalty and attachment to the royal cause. It now returns one member to the imperial parliament. The living is a rectory in the diocese of Connor and archdiocese of Armagh; patron, the marquis of Hertford, who is owner in fee of the whole town. The *parish* of Lisburn is partly in the county of Antrim, and partly in the county of Down. It contains 13,249 inhabitants, of which 5218 are in the town, 5941 in that part of the county which is in Down, and 2090 in that which is in Antrim.

LIVERSEEGE, Henry, a very promising young painter in the higher walks of the art, was born at Manchester in the year 1803, and from infancy was afflicted with asthma. His father was connected with the cotton-trade, but he was indebted to an uncle for his education. The exact period cannot be fixed upon when first he decided on pursuing the arts; but, it was long ere he discovered the true bent of his genius—dramatic painting; for the earlier periods of his youth were spent in portrait-painting. On his first composition in this style being exhibited at Manchester, it immediately attracted the notice of many judges of taste; and from that time his affairs began to assume a more brilliant aspect, and he was enabled to pursue the studies most congenial to his feelings and habits. Every new composition afforded indubitable signs of the felicity of his choice, and of his rapid improvement in the art. He possessed a vivid perception of the beauties of poetry and romance; his compositions are derived chiefly from works of imagination, and are treated in a manner which clearly attests his aptitude for this particular style. His picture of the "Black Dwarf," taken from Scott's novel, was the first subject he exhibited at the royal academy. About 1826, he began to visit London for three or four months at a time, to draw at the British Museum, and copy at the British Institution; and his copies at the latter place were admirably close in resemblance to the originals, especially those from Rubens, Vandyke, and Teniers. To the exhibition of the society of British artists in 1830, he sent his painting called "The Inquiry," representing a country lad, with game, standing before a burly and pompous porter at the door of a country mansion. In the exhibition of this society in 1831, he had three paintings;—the "Grave-diggers," from Hamlet; "Catharine Seyton," and "Benedicite, or Holy Daughter." To the royal academy exhibition of 1831, he sent two pictures, "Sir Piercie Shafton, and Mysie Happer," from Scott's Monastery, and "Hamlet and his Mother in the closet." In 1830, he exhibited at the British Institution the "Weekly Register," representing a cobbler devouring with straining eyes the contents of Cobbett's last Register. And in the following year he had "Captain Macheath in Prison." To the Manchester Exhibition in August, 1831, he sent four paintings:—"The Register," "Don Quixote in his Study," "The Fisherman," and another "Don Quixote." The picture of "Don Quixote" was exhibited at the British Institution in 1832, together with one called "The Recruit,"—an enlisted country bumpkin in an alehouse: an admirable production, a water-colour sketch of which, also, he completed. During his stay in London in the summer of 1831, he finished several pictures, both in oil and in water-colours. One in oil, which he did not live to complete, was "Salvator Rosa among the Banditti:" and another was "Edie Ochiltree," from the Antiquary. Among his sketches in water-colours were "Slender and Anne Page" and "Sir John Falstaff and Bardolph." Liverseege's death took place at London, on the 13th Jan. 1832. In height he was about five feet five, of a thin spare body, and rather deformed in the left shoulder; complexion very pale; countenance restless and inquiring; his eyes especially always bespoke continual anxiety, and his mouth great nervousness and irritability. In temper he was irritable; which, however, did not arise from malevolence of nature, but was the effect of ill-health;—in disposition he was humane and generous;—in mind, elevated and refined;—in his manners, gentlemanly and courteous.

LLANDAFF; (*i. e. church on the Taff*,) a village in the county of Glamorgan, Wales, situated on the river Taff, 162 miles from London. It claims the title of city from being the see of a bishop. It has a small harbour on the north bank of the Severn, two miles from Cardiff. Population in 1841, 1276.

A church was founded here immediately after the introduction of Christianity into Britain; and about the close of the fifth century, Saints Germanus and Lupus, the virtuous opponents of Palagianism, consecrated Dubricius to be the first bishop of this see: upon his translation to Caerlleon, Teliaus succeeded to Llandaff. The names of the bishops of this diocese from its foundation to the close of the ninth century, are all preserved, but the dates of their consecrations and deaths are uncertain. The see comprehends about three-fourths of the county of Glamorgan, and the whole of Monmouthshire, seven parishes excepted.

The cathedral was erected during the prelacy of bishop Urban, A. D. 1120, and some beautiful specimens of Norman architecture still survive amongst the extensive ruins. Some parts of this venerable edifice were repaired, chiefly at the expense of bishop Watson, but the renovation was in an unhappy style, quite neglectful of the elegant proportions of the great original itself. The altar is placed beneath the portico of a Roman temple, not in harmony with any other passage in the whole fabric. The ancient chapter-house and muniment room, are well preserved. Here are also a new chapter-room, with a kitchen, and an office for the proctor-general, in the church-yard. Several ancient monuments adorn and give interest to this fine structure. The see of Llandaff can boast of having possessed, within the last seventy years, the distinguished names of Shipley, Barrington, Watson, Marsh, Van Mildert, Sumner, and Copleston.

LLANGOLLEN; a town in the county of Denbigh, Wales, situated on the river Dee, the great post road from London to Holyhead passing directly through it. The bridge here over the Dee, erected by the bishop of St Asaph, in 1346, is a great curiosity. About two miles from it is the abbey of Valle Crucis, and not far from it the ruins of one of Owen Glendower's castles.

The influx of tourists, during the summer, to the romantic vale of Llangollen, contributes greatly to the support of the villagers. Manufactures of flannel and cotton, both upon rather an extensive scale, occupy many hands. The lime-kilns in this parish, and coal-mines in the adjoining, also afford much employment; and the Ellesmere canal, which is conveyed across the Dee, from one side of the vale to the other, by an aqueduct 1007 feet in length, affords commercial facilities of great advantage to this parish. The canal is fed by the river Dee, and extends along the vale from the aqueduct to the Oernant slate-quarries. Population of town and parish of Llangollen in 1841, 4906.

LODGE, Edmund, K. H. Clarenceux King of Arms, F. S. A., son of the Rev. Edmund Lodge, rector of Carshalton in the county of Surrey, was born in Poland street, London, on the 13th of June, 1756. He became a cornet in the King's own regiment of dragoons in 1772; but disliking the military profession, he remained only a short time in the army. Having shown a taste for literature and antiquities, the situation of Blue Mantle Pursuivant-at-Arms was obtained for him on the 22nd Feb. 1782. He was promoted to be Lancaster Herald on the 29th Oct. 1793, Norroy on the 11th June 1822, and Clarenceux on the 30th July 1838. Mr Lodge's talents first became known by the publication of the Talbot, Howard, and Cecil papers in the college of arms, which appeared in three volumes, 4to. in 1791, entitled, "Illustrations of British History;" and the ability with which they were edited at once established his reputation. His next publications were the memoirs attached to Chamberlaine's "Imitations of original drawings by Hans Holbein," which came out in parts between 1792 and 1800. In 1810 he published (without his name) "The Life of Sir Julius Cæsar, with memoirs of his family and descendants," in quarto, with numerous portraits. But the work upon which Mr Lodge's reputation will principally rest are his well-known memoirs in the "Portraits of Illustrious Personages of Great Britain," originally published in 1821; of which it is no exaggeration to say, that they are a model of biographical composition. Mr Lodge published no other work; and his only additional writings (besides a few unimportant articles) are the preface to the second edition of the Antiquarian Repertory, the preface to Sir Hanbury Williams's Poems, and reviews (we believe) of the Sadler Papers, History of London, Scott's edition of Swift, &c., in the Quarterly Review. From motives of benevolence he was induced to lend his name to an Annual Peerage; but we are informed that the merit of those accurate volumes (for the work has been frequently reprinted) belongs entirely to the ladies whose names are affixed to the dedication. Through the influence of a nobleman, no less distinguished for his literary attainments than by his public services, Mr Lodge was nominated a knight of the order of the Guelphs of Hanover in 1832. The honour was granted solely in consideration of his talents, and without the slightest solicitation on his part. He died, Jan. 16, 1839, aged eighty-three.

LONG, John, a noted quack doctor of the present century, was born at Newcastle, in the county of Limerick, in the year 1798. He was the second son of John Long, in whom were united as many callings as Dicky Gossip ever exercised; for, besides basket-making, which was his original occupation, he was steward, parish-clerk, harness-maker, wire-worker, constructor of winnowing machines, and vender of every thing. His mother's name was Anne St John. At an early age, John emulated his father as a "Jack of all trades." In addition to the hereditary occupation of basket-making, he became a carpenter, a painter, and a glazier. Before he was seventeen years of age, however, he had thrown aside the chisel and the diamond, and confined himself entirely to the pencil. A lady of the name of Schuter, who lived in Doneraile, was the first person who noticed his early talents: she gave him little prints and drawings to copy; and, whilst thus stimulating his exertions, instructed him by her advice. Public interest was soon excited in favour of so promising a boy; and a subscription was made by the Doneraile family, and the gentry in the neighbourhood, to send young Long to Dublin, where, towards the end of 1816, he was placed, for two years, under the care and instruction of an ornamental furniture painter. He afterwards employed himself in giving lessons as a drawing master, in Limerick, and also at different places in the county of Cork. He painted several still-life pieces; took some views, among others one of Kicoleman castle, the residence of Spencer, and the place at which he wrote "The Faerie Queen;" and even attempted portraits. It was about this time, that he assumed his maternal name of St John, as an addition and improvement to his baptismal name of John. He soon panted, however, for a wider and a nobler field of action; and in the year 1822, he set off for London. His stock in trade consisted of some of his own paintings, and a scripture piece, representing "The Woman taken in Adultery," which he had restored from a state of sad mutilation, and on which, with an enthusiasm pardonable in young minds, he relied, as a kind of bank on which he might draw for future subsistence. This picture afterwards contributed to ornament Mr Long's principal receiving room in Harley street. What it was which induced the young artist to relinquish the pencil, and to undertake the cure of consumption,—we have been unable to discover. In a letter to a friend, written in the year 1826, he mentions having successfully treated a carriage-painter, who was apparently in a decline. The result of this first attempt encouraged him to proceed; and as, like all young practitioners, he prescribed gratis, he had no want of patients. In the beginning of 1827, he states, in a letter from Bakewell, near Bristol, that he had applied his, "discovery," as he calls it, successfully, not only in cases of consumption, but in rheumatism and other complaints. He here began to receive fees; and after realising enough to clear his debts, he returned to London. For a short time, Howland street, Fitzroy square, was the place of Mr Long's residence; but increasing business gave increasing confidence; and, in the beginning of 1828, he took possession of the house, No. 41, Harley street, Cavendish square, where he adopted the new course of receiving all his patients; having rooms handsomely fitted up for the purpose, and a suitable establishment of servants in attendance. Harley street was every day thronged with carriages conveying rich and noble patients to and from his residence. In the year 1830, a young lady of the name of Cashin, who had been one of Mr Long's patients, happening to die a few days after she was taken from under his care, an inquest was held on the body, and a verdict of "manslaughter" was found against Mr Long. This verdict led to a prosecution. At the trial, no fewer than sixty-three of his patients, most of them persons of rank and opulence, appeared as witnesses in support of Mr Long's practice. The jury, however, brought in a verdict of guilty; upon which he was fined £250 and discharged. In the subsequent year, Mr Long was again tried, in consequence of the death of a Mrs Lloyd, who had been under his care; but was acquitted. His own death, which took place on the 2d July, 1834, was attributed to a fall from his horse several months before. Although he complained of a pain in his side after the accident, he could not be prevailed upon to apply any of his own or other remedies to relieve that pain, or to cure him of a cough which he had contracted. The consequence was that he fell into a rapid decline. He bequeathed the bulk of his property to his brother William; in which bequest is included his *discovery*, or secret, which he desires may be sold for £10,000. It is understood that the secret has been purchased.

LONGFORD; a small county of Ireland, in the province of Leinster, comprehending an area of 263,645 acres, of which 192,506 are cultivated land, 55,247 are bog and mountain, and 15,892 are covered with water. It is bounded on the north by the counties of Cavan and Leitrim; on the east and south by Westmeath county; and on the west by the navigable river Shannon. It presents for the most part a level surface, with the exception of the north-western angle, which is occupied by a chain of rugged hills, forming, in part, the separation between this county and Leitrim. The Shannon is the principal river of the county, after which come the Inny, Camlin, Tallen, and others of minor importance. Lakes are numerous, and abound with fish. Longford is almost entirely an agricultural county. Wheat, barley, and oats, are grown extensively, and transported to the markets of Dublin and Drogheda. Minerals have not yet been discovered to any extent. Iron ore is found in the mountains in the northern baronies; and it is probable that the Leitrim coal-field extends into the same district. The civil division of the county includes the baronies of Abbeyshruel, Ardagh (an ancient bishopric), Granard, Moydow, and Rathcline. In these are several good towns, the chief of which are Longford, the assize town, (situated on the river Camlin, seventy-four miles, W. from Dublin; pop. 4354) Granard, Edgeworthstown, (q. v.) Ballymahon, and Lanesborough. Linen is manufactured in various places, and markets for linen and yarn established in the principal towns. The navigation of the river Shannon, in its passage along the boundary of this county, admits of a free mode of transport to the port of Limerick, and so on to the Atlantic; while the extension of the royal canal to Richmond Harbour, with a branch to the town of Longford, throws open the market of the metropolis to this county. Population in 1811, 115,491. Longford is the native county of Oliver Goldsmith and Maria Edgeworth.

LONSDALE, James, an eminent portrait painter, was born in Lancaster, on the 16th May, 1777. One of his earliest friends was a gentleman of the name of Threlfall, an architect of that town, who, perceiving his young friend to possess considerable talent, and a great love for drawing, lent him every facility which his house could afford for his improvement. Some years afterwards, when he had made considerable advancement, the late duke of (then lord Archibald) Hamilton saw several of his drawings, and was so much pleased with the promise they displayed, that he invited him to Ashton hall, his Grace's seat, in the neighbourhood of Lancaster. Here he became acquainted with lady Ann Hamilton, the late duchess of Somerset, and the countess of Dunmore, the duke's daughter, who ever afterwards entertained the highest regard and esteem for him, both as an artist and a man. Mr Lonsdale finding that, however agreeably his time was passed at Ashton, another field was necessary for the development of his strength, and for the establishment of his reputation as an artist, determined at once to visit the metropolis. This, however, was not done without his having all the difficulties of such a course fully laid before him by the duke. Nothing disheartened by these considerations, which he had already well weighed in his own mind, he set off for London, and immediately after his arrival was received by Romney into his house as a pupil. He soon afterwards took lodgings in London, and became a constant attendant at the royal academy; but he every year, in the prosecution of his profession, returned to Lancaster, and always with increasing reputation and success. At Opie's death, Mr Lonsdale had been so successful, that he was enabled to purchase the house of that eminent artist, in Berners street, in which he resided the remainder of his life. Soon after he had established himself there, he became acquainted with the late duke of Norfolk, who engaged him to paint the large historical picture of King John signing Magna Charta, which was afterwards executed in stained glass, and placed in the baron's hall at Arundel castle. He also painted several whole-length portraits of his Grace. The original, which is an admirable likeness, full of character, and executed with striking ability, is now in the possession of the present duke. Another, a large whole-length, is, we believe, placed in the county-hall at Hereford. About this time he also had the honour of being patronized by his royal Highness the duke of Sussex, of whom he painted several portraits, as well as those of many of his royal Highness's personal friends. The late queen Caroline appointed him her Majesty's portrait-painter, and he executed several pictures of her, which were striking and characteristic likenesses. One of them, a half-length, with her celebrated letter to George IV. in her hand, is in the council-room at Guildhall. Amongst others of the numerous list of distinguished men who were the subjects of Mr Lonsdale's pencil, we may mention the emperor of Russia, the king of the Belgians, the grand duke Maximilian, the duke of Leinster, the duke of Argyll, Dr Parr, Sir Humphrey Davy, Talma, &c. &c. He became a member of the Beef-Steak club soon after his acquaintance with the duke of Norfolk, (by whom, we believe, he was introduced there,) and in that society formed a friendly intercourse with many of the most distinguished characters of his time. His portraits of lord Brougham and baron Wood are full of character, and perfectly identify the men. His three last pictures painted shortly before his death, were lord Camperdown, lord Zetland, and lord Dinorben. As an artist, he was more intent in bringing out the peculiarities of the mind, in conjunction with a strict, but judicious, representation of the features, than in working up inferior details, and in rendering his pictures captivating to common observers. Mr Lonsdale's death took place on the 17th Jan. 1839. He married, shortly before he purchased Opie's house a lady from Lancaster, by whom he left three sons. In private life he was highly esteemed; and numbered among his friends many of the most distinguished men of the age for wit, ability, and high birth.

LOUGHBOROUGH; a town in the county of Leicester, situated on the river Soar, on the great road from London to Manchester, distant 108 miles from the former. The town has, within these twenty years, been much improved by the erection of a new market-house and many handsome private edifices. The manufactures carried on here are those of cotton, worsted, and merino hosiery, and bobbin-net lace. For the last-mentioned article a patent was obtained, and the manufacture was confined to this place till the riots of the Luddites, during which the patent machinery was destroyed, in consequence of which the establishment was removed to Devonshire; but since that time the making of bobbin-net has been again introduced. Population of town and parish in 1841, 10,170.

LOUTH; a town in Lincolnshire, 144 miles from London, situated on the small river Lud, from which a canal has been constructed, communicating with the sea about seven miles distant. The principal public buildings are a town-hall, an assembly-room, and a theatre; and there are billiard-rooms and news-rooms. The town is lighted with gas. An extensive carpet and blanket manufactory has been established here; and among the other branches of industry, are worsted-spinning and making woollen stuffs, soap-boiling, and making coarse paper; besides which, here are ship-builders, mast, block, and pump-makers, machine-makers, iron-founders, and millwrights. By the Louth canal, vessels of considerable burden trade regularly to Hull and other parts of Yorkshire northward, and southward to London, carrying cargoes of wool and corn, and importing in return timber, coal, grocery, and other articles. Population of parish in 1841, 8935.

LOWESTOFF, OR LOWESTOFT; a town in the county of Suffolk, situated on a headland bordering on the German ocean, 114 miles from London. It is said to be the most easterly point of land in England. The headland or cliff is partly covered with gardens, forming terraces on the declivity; and between these gardens and the sea is a tract about half a mile in breadth, called the *Denes*, on which is an extensive line of fish-houses. The recent construction of an artificial harbour, and other works connected with the Norwich and Lowestoff navigation, has added to the commerce and prosperity of the place. Lowestoff has a large share in the herring-fishery, the Lowestoff herring being esteemed in England as the Lochfine are in Scotland. It has also a considerable trade in mackarel. The place is much frequented for sea-bathing in the summer. Population in 1841, 4647.

LUMSDEN, MATTHEW, LL. D., late professor of Persian and Arabic in the college of Fort William, Calcutta; entered into the employ of the East India Company in the year 1794. His official station was first in the stationery department; but he appears to have applied himself with so much success to the study of the Persian and Arabic languages as to induce the governor-general, on the 12th of May, 1803, to place him on the establishment of the college of Fort William in the capacity of an assistant to captain Baillie, then the professor of those languages in that institution. In the following year he was highly commended by the government for his progress in the preparation of a Persian grammar; a work which he published in the year 1805. In 1808 he was appointed to succeed captain Baillie, as Persian and Arabic professor, still continuing to perform his duties under the stationery committee. In 1812, the Bengal government, having then under their consideration the state of the Calcutta Madrissa, or Mahomedan college, appointed Dr Lumsden, with Lieut. A. Galloway, to suggest such reforms as they might deem needful in that institution. In the discharge of this duty, they fully succeeded; and Dr Lumsden was appointed secretary to the Madrissa, with instructions to superintend it, and the various translations from English works into the Persian language, which were then in progress at the Madrissa. He published a new edition of his Persian grammar in 1810; and an Arabic grammar in two volumes folio, in 1813. In 1814 he received charge, as superintendent, of the Company's press at Calcutta, which he retained about three years. In 1818, he undertook, in addition to the duties of his professorships, those of secretary to the stationery committee; but his health soon exhibited symptoms of a rapid decline, which compelled him to quit India. Dr Lumsden came to England by way of Bombay, through Persia, Georgia, and Russia; and his departure was announced in the Indian prints as the loss to India of "one of the greatest orientalists of his age, to whose instruction a great body of the Company's servants, who were then performing the most important services in all parts of India, were indebted for that knowledge of the diplomatic language of India, which qualified them for the discharge of their official duties." His private virtues were described as "quite as distinguishing, although not so conspicuous, as his professional abilities." He arrived in England in 1820, in a state of health somewhat improved by journeying through a colder climate. In the following year he returned to India, and was again, on the 25th of January, 1822, appointed professor of Arabic and Persian in the college of Fort William; and in March, 1822, placed over the Calcutta Madrissa. These appointments he held till 1825, when he resigned the service of the Company, and arrived in England in 1826. Upon his final retirement from the service in India, the Madrissa committee recorded their sense of his merits and services in strong terms, ascribing the then highly flourishing state of the institution solely to his exertions to promote its prosperity. After his return to this country he lived in retirement till the period of his decease, which took place at Tooting Common, Surrey, March 31, 1835, aged fifty-eight.

LURGAN; a town in the county of Armagh, eighty-five miles N. from Dublin. It is a thriving place, the inhabitants being chiefly employed in the manufacture and sale of linen, cambrics, lawns, diapers, diaper-damasks, and cottons. The coaches from Belfast to Armagh pass through it. Population in 1841, 4677. since which time it has much increased.

LYNN-REGIS, OR KING'S LYNN; a sea-port town in the county of Norfolk, situated on the right bank of the river Ouse, about eight miles from the sea, and distant from London ninety-six miles N. by E. The town is a mile and a half in length and half a mile in breadth, consisting of two principal streets and several minor ones, which are narrow, but well paved and lighted. Through the town run four small streams, over which there are several bridges. The principal public buildings, exclusive of the churches, are the guildhall or town-hall, an ancient structure of stone and flint, containing several apartments, in which are portraits of the Walpoles and others; adjacent to it, is the bridewell or house of correction; the custom-house, erected in 1683, at the expense of Sir John Turner, thrice mayor, and many years member of parliament for Lynn, it was originally designed as an exchange for merchants; the market-place, an area of about three acres, in the centre of which is a market-cross of freestone, with sculptural and other embellishments; and the theatre, erected in 1813. There is a public walk, called the New Mall, about 340 yards in length, bordered on the sides by quickset hedges, and having recesses and seats at convenient distances. In the High street is a public library, founded in 1797, and supported by subscription, containing a good collection of useful books; and in 1826 was opened a Mechanics' Literary and Scientific Institution.

The harbour of Lynn is capable of receiving 300 sail of vessels, but is difficult of access from the numerous and perpetually shifting sand-banks in the river. The imports are principally corn, coal, timber, hemp, wine, fruit, &c.; the exports, chiefly agricultural produce, and a fine sand used in making glass. Population of town in 1841, 16,039.

LYON, George Francis, an enterprising traveller, was a native of Chichester, and son of colonel Lyon of that city. He was educated at Dr Burney's naval academy at Gosport, and entered on the books of the royal William flag-ship at Spithead, in 1808. He first sailed in the Milford 74, in Aug. 1809; and, after serving for several months on the French coast, he proceeded to Cadiz in the same ship, and on the 23d of November, 1810, he was engaged in one of the Milford's boats in an attack on several of the enemy's gun vessels near Santa Maria. The Milford left Cadiz in the summer of 1811, and joined the fleet off Toulon; and, as Sir Richard shifted his flag into the Hibernia, a beautiful first-rate, young Lyon was removed into her as a follower of the admiral. Mr Lyon's next ship was the Caledonia 120, bearing the flag of the late lord Exmouth, who shortly afterwards appointed him acting lieutenant of the Berwick seventy-four, captain Edward Brace, under whom he served at the reduction of Genoa, in April 1814. On the 8th of the same month, he was wounded in an attack made by the boats of the Berwick and Rainbow upon the enemy's posts near the pass of Rona, with a view to favour the advance of the British army, under lord William Bentick. During the war with Murat, in 1815, lieutenant Lyon was present at the siege of Gaeta, by the combined Austrian and Anglo-Sicilian forces. On the last day of that year he was appointed to the Albion, seventy-four, fitting for the flag of rear admiral (after Sir Charles) Penrose, in which ship he bore a part at the battle of Algiers, August 27, 1816.

In September, 1818, Mr Ritchie, a gentleman of great science and ability, employed by the British government on a mission to the interior of Africa, arrived at Malta (where the Albion was then lying) attended by M. Dupont, a Frenchman in his pay, whom he had engaged at Marseilles for the purpose of collecting and preparing objects of natural history. It was understood that capt. Frederick Marryat, R. N., was also to have accompanied Mr Ritchie, but that circumstances had occurred which induced that officer to relinquish his intention of joining the mission. Soon after Mr Ritchie's arrival at Valette, he became acquainted with lieutenant Lyon, who, hearing him express his disappointment at having failed to obtain capt. Marryat as his companion on the proposed expedition, offered to supply his place, "hoping that the zeal by which he was actuated, would, in some degree, make amends for his deficiencies in other respects." Mr Ritchie, without hesitation, accepted his proposal, and, in consequence, lost no time in requesting Sir Charles Penrose to solicit the necessary permission for his quitting the Albion. On the 19th of November a favourable answer was received from the admiralty; and lieutenant Lyon, who had employed himself during the interval in acquiring the Arabic alphabet, and in otherwise preparing himself for the object in view, immediately followed Mr Ritchie to Tripoli, where he landed on the 25th of the same month. In 1821, he published his Journal, under the title of "A Narrative of Travels in Northern Africa, accompanied by Geographical Notices of Soudan, and of the Course of the Niger," with a chart of the routes, and a variety of coloured plates, illustrative of the costumes of the several natives of that country. The tour is divided into two parts; the first comprises a journey over the Gharian mountains to Benioleed, and the subsequent progress of the mission from Tripoli to Mourzouk, the capital of Fezzan (lat. 25° 54′ N., long. 15° 52′ E.,) where Mr Ritchie died on the 20th of November, 1819; the second embraces Mr Lyon's proceedings between that period and March 25th, 1820, when he returned to Tripoli, after an absence of exactly one year,—"it being deemed too hazardous to attempt advancing any farther into the interior without fresh authority and additional pecuniary supplies from Government." During this period lieutenant Lyon wore the dress of a Moslem, kept his head shaved, allowed his beard to grow, and travelled under the name of Said-ben-abd-Allah.

After his return to England, capt. Lyon was promoted to the command of the Hecla bomb-vessel, then fitting out at Deptford, for the purpose of exploring Repulse Bay, &c. in company with, and under the orders of capt. Parry. This expedition sailed from the Nore on the 8th May, 1821, and remained out during the whole of two seasons; after which they returned home in October, 1823, their partial success in having made considerable additions to the geographical and scientific history of the North Sea, receiving very warm testimonies of the public approbation. Captain Parry's history of the expedition is well known. Captain Lyon's "Private Journal" was also published, and has been aptly termed "The Sayings and Doings of the Esquimaux." He was rewarded with post rank, dated Nov. 13, 1823; and on the 16th of Jan. he was presented with the freedom of his native city of Chichester, and entertained by the corporation at a public dinner. The freedom was enclosed in an oaken box, turned from a portion of the Hecla, lined with gold, and bearing the following inscription:—"Presented, Jan. 16, 1824, by the mayor, aldermen, and citizens of Chichester, to George Francis Lyon, Esq. Captain in the Royal Navy, in testimony of their admiration of the zeal, perseverance, and spirit of enterprise displayed by him in his travels in Northern Africa, and in the late voyage to the Polar Sea, in search of a north-west passage."

A few days before this gratifying occurrence, capt. Lyon had been appointed to the Griper bark, fitting out for another voyage of discovery in the icy regions. This vessel was originally a gun-brig of only 180 tons burthen; but she had been considerably strengthened and raised upon, to enable her to accompany lieutenant Parry in the expedition of 1819; and her complement now consisted of forty-one persons, including capt. Lyon. She sailed from the Nore on the 16th of June, 1824, for the purpose of making an attempt to connect the western shore of Melville Peninsula with the important discoveries of capt. Franklin; and was accompanied as far as the coast of Labrador by the Snap surveying vessel, which had been ordered to carry out a spare bower-anchor and part of her stores. After undergoing many hardships in the course of an exploratory voyage, the Griper returned to England in November of the same year. Capt. Lyon published a narrative of his voyage, with a reduced chart of his route, and an appendix, containing magnetic and botanical observations. In June 1825, the honorary degree of D. C. L. was conferred upon him by the university of Oxford; and, on the 5th of Sept. following, he married Lucy Louisa, the younger daughter of lord Edward Fitzgerald. Not long after, he went to Mexico, as one of the commissioners of the Real del Monte mining company. Returning home, by way of New York, in the Panthea packet, bound to Liverpol, he was wrecked in a gale at Holyhead, Jan. 14, 1827, and lost every thing belonging to him, including his journal, plans of the mines, &c. To add to his mortification, he heard, upon landing, of the death of his wife, which had taken place about four months before.

Captain Lyon afterwards returned to South America on mining business, which he prosecuted with his wonted intelligence; and the specimens of South American minerals which he forwarded to this country are evidences of his taste. At length his sight began to fail him to an alarming degree, insomuch that he determined to revisit England for advice. He accordingly embarked for that purpose, but died, on board his Majesty's packet the Emulous, on her passage from Buenos Ayres, Oct. 8th, 1832, at the age of thirty-seven; thus prematurely concluding a life of extraordinary adventure, attended by extraordinary misfortunes.

LYON-KING-AT-ARMS; an officer of great antiquity in Scotland, so called from the armorial bearing of the Scottish kings, the lion rampant. The Lord Lyon's rank is superior to that of any other king of arms, as he holds his office immediately from the sovereign, by commission under the great seal. Formerly, one of his duties was to carry public messages to foreign states. The officers serving under him are heralds, pursuivants, and messengers. They are all created by him, and amenable to his jurisdiction. He is empowered to inspect the arms and ensigns-armorial of all the noblemen and gentlemen in the kingdom, and to give proper arms to deserving persons; to matriculate such arms, and to fine those who use arms which are not matriculated in £100 Scots, with the forfeiture of the goods and furniture on which the arms are represented. The court of session has the power of reviewing the decision of the Lyon Court as to the matriculation of arms, but a reduction of a matriculation of arms is incompetent at the instance of a party who does not claim right to the arms in question. The regalia of this officer are very sumptuous, and are worn on solemn occasions. Before the revolution, on his admission to office, he was solemnly crowned by the sovereign or his commissioner, in presence of the nobility, &c. The Scottish poet, Sir David Lindsay of the Mount, was lord-lyon-king-at-arms.

LYRE-BIRD, OR MENURA, a beautiful bird found in Australia, and placed by some naturalists among the gallenaceous order of birds; by others, among the passerine. It equals a common pheasant in size, but its limbs are longer in proportion, and its feet much larger; the toes are armed with large arched blunt claws; the hind toe is as long as are the fore toes (the length of these being nearly equal), but its claw is larger than that of any of the others; the scales of the tarsi and toes are large bold plates, and their colour is glossy black; the head is small, the beak, as Cuvier has described it, is triangular at the base, pointed and compressed at the tip; in the male the feathers of the head are elongated into a crest; the wings are short, concave, and rounded, and the quill feathers are lax and feeble; the general plumage is full, deep, soft, and downy. The tail is modified into a beautiful long plume-like ornament, representing, when erect and expanded, the figure of a lyre, whence the name of lyre-bird. This ornamental tail is, however, confined to the male. In the female the tail is long and graduated, and the feathers are perfectly webbed on both sides of the shaft, although their texture is soft and flowing. In the male the tail consists of sixteen feathers, of these the outer one on each side is broadly but loosely webbed within, its outer web being narrow; as it proceeds it curves outwards, bends in, and again turns boldly outwards and downwards, both together resembling the framework of an ancient lyre, of which the intermediate feathers are the strings; these feathers, except the two central, which are truly but narrowly webbed on the outer side, consist each of a slender shaft, with long filamentous bubules, at a distance from each other, and springing out alternately. The appearance of these feathers, the length of which is about two feet, is peculiarly graceful; their colour is amber brown, but the two outer tail-feathers are gray tipped with black, edged with rufous, and transversely marked on the inner web with transparent, triangular bars. The general plumage of the menura is amber brown above, tinged with olive, and merging into rufous on the wings, and also on the throat. The under parts are ashy gray. With respect to the habits of the lyre-bird much yet remains to be known. Shaw, in the account he collected, observes that its powers of song are very great:—"At the early part of the morning it begins to sing, having a very fine natural note; and gradually ascending some rocky eminence, scratches up the ground in the manner of some of the pheasant tribe, elevating its tail, and at intervals imitating the notes of every other bird within hearing; and having continued this exercise for about two hours, again descends into the valleys or lower grounds."

It is in the hilly districts of Australia that the menura is to be found, and its manners are shy and recluse; it is almost exclusively terrestrial, seldom taking wing, and when forced to do so flying with labour and difficulty. Dr Latham remarks, "It is said that it will frequently imitate the notes of other birds so as to deceive most people;" and we may here add that the musical powers of this bird, which we have been inclined to doubt, have been confirmed to us by the testimony of a gentleman who, during his residence in Australia, had many opportunities of gaining information on the subject, and he assured us that not only were its own notes rich and melodious, but that it imitated those of other birds with surprising tact and execution. Mr George Bennett, however, who notices the menura, in his "Wanderings in New South Wales," does not allude to this circumstance, one of considerable importance;

he neither confirms the statements of Shaw and others respecting its powers of song, nor refutes them as erroneous. His information is nevertheless interesting. The native names of the menura, according to this gentleman, are "béleck béleck," and "balangara;" it is common in the mountain ranges in all parts of the colony of New South Wales, but it has been much thinned in its numbers in some districts, in consequence of the tail-feathers of the male being saleable at Sydney, where they are highly valued. In the ranges of the Illawarra district, where it once abounded, the menura is very rare. "The lyre-bird," observes Mr Bennett, "is a bird of heavy flight, but swift of foot. On catching a glimpse of the sportsman, it runs with rapidity, aided by the wings, over logs of woods, rocks, or any obstruction to its progress; it seldom flies into trees except to roost, and then rises only from branch to branch. They build in old hollow trunks of trees which are lying upon the ground, or in the holes of rocks; the nest is merely formed of dried grass, or dried leaves scraped together; the female lays from twelve to sixteen eggs, of a white colour, with a few scattered light blue spots; the young are difficult to catch, as they run with rapidity, concealing themselves among the rocks and bushes. The lyre-pheasant, on descending from high trees, on which it perches, has been seen to fly some distance; it is more often observed during the early hours of the morning and in the evening, than during the heat of the day. Like all the *gallinaceous tribe*, it scratches about the ground and roots of trees, to pick up seeds, insects, &c. The aborigines decorate their greasy locks, in addition to the emu feathers, with the splendid tail-feathers of this bird when they can procure them." Dr Latham says, "I do not find that it has been yet attempted whether this bird will bear confinement; but if the trial should turn out successful, it would be a fine acquisition to our menageries." This hint has, we believe, never been acted upon; the lyre-bird has not as yet been conveyed alive to Europe.

LYSONS, Rev. Daniel, F.R.S. F.A.S. F.H.S. F.L.S., &c., was born on the 28th of April, 1762. His father, the Rev. Samuel Lysons, was incumbent of Rodmarton, near Cirencester. Having completed his early studies at Bath, Mr Lysons graduated at St Mary Hall, Oxford. On taking orders in 1784, he commenced his clerical life as curate to his maternal uncle, Mr Peach, of Mortlake, in Surrey. Shortly afterwards he preached by appointment, and according to custom, published, the annual sermon for the Colston charity at Bristol. In 1789 he removed to Putney, as curate to the Rev. Dr (then Mr) Hughes, preceptor to the royal family, and afterwards canon residentiary of St Paul's, in whom he found an enlightened and congenial friend. Having conceived the project of writing a topographical work on the environs of London, Mr Lysons, at that time possessed a limited income, and unknown to the leading London booksellers, was at first deterred by considerations of risk and expense. Averse to the idea of publishing by subscription, he resolved on accepting the proffered loan of £200 from Mr Hughes and another friend; determining to supply the deficiencies consequent on so small a fund by labour and diligence. In the illustration of his work he was aided by the pencil of his brother Samuel, whose etchings, executed from drawings taken by himself, were remarked for their masterly accuracy. The first edition of "The Environs of London" was published in the year 1792, and met with the most flattering reception from the public. Its rapid and extensive sale soon enabled the author to repay his friends their timely loan, and to realize a considerable sum to himself. In 1800 Mr Lysons, on account of his father's declining health, resigned the cure of Putney, and undertook that of Rodmarton and Cherenton. In 1804 the death of his father put him in possession of the living of Rodmarton, as well as the family property of Hempstead, inherited from an elder uncle. The increase of means and leisure soon suggested to his mind the commencement of a project which, in concert with his brother Samuel, he had entertained since the publication of "The Environs of London," and for which, during four years, they had made the necessary collections. This work, "The Magna Britannia," comprised in its design the topographical history of the several counties of England in alphabetical order. In the arrangement of the different departments of this voluminous undertaking, the great mass of necessary correspondence fell on the elder brother; and the whole of the general, parochial, and family history was also furnished by him. No sheet, however, was printed without being subjected to the joint revision of the brothers. The first part of the Britannia, comprising Bedfordshire, was published in 1806. In 1819 Mr Lysons sustained a severe blow in the death of his brother Samuel. The work had now reached, in alphabetical order, the county of Devon, every parish of which the two brothers had personally visited in order to complete their materials. Considering himself pledged to the completion of this volume, he persevered so far in a task rendered irksome to him by distressing recollections, but abandoned all idea of carrying his project farther. In his brother, warmly attached to him from childhood, and associated in all his plans and feelings, he had lost a coadjutor and friend not to be replaced; and the infirmities of middle age, aggravated perhaps by mental and bodily exertion, had begun to tell on a frame and spirits originally robust. The future prosecution of the work was therefore abandoned for less fatiguing but more important duties; each county, however, of the Britannia may be considered as a separate topographical history in itself, and is in fact sold as a separate work. In 1812 Mr Lysons published a history of the origin and progress of the meeting of the three choirs of Gloucester, Worcester, and Hereford, and of the charity connected with it. To impart to his publication more than a merely local interest, he prefixed to it a history of the parochial clergy from the earliest times, containing much valuable information; and which was, at the desire of his friends, reprinted and sold as a separate work. In 1818, he published a selection of sermons from the works of Jeremy Taylor, containing those passages peculiarly marked by beauty of thought and expression, and omitting whatever seemed unsuitable to the present day. To the volume in question were prefixed three sermons of his own, preached on different public occasions. He died on the 3d Jan. 1834. He was twice married, and left a family.

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MACADAM, John Loudon, the great improver of roads, whose improvements, however, are likely to be to a large extent superseded by the general adoption of railways, was the representative of an old and respectable landed family—the Macadams of Waterhead, in the stewartry of Kirkcudbright. He was born, September 21, 1756, in the town of Ayr and received his education at the school of Maybole. On the death of his father in 1770, when he was only fourteen years of age, he was sent to New York, where his uncle William, a younger brother of his father, had been settled for some years as a merchant. Here he remained fourteen years, during which the war of independence took place. Under the protection of the British forces, who possessed the city, he realized a considerable fortune, as an agent for the sale of prizes. At the conclusion of the war, he returned, with the loss of nearly the whole of his property, to his native country, and resided for some time at Dumcrieff, a beautiful place in the neighbourhood of Moffat, subsequently the seat of Dr Currie, the biographer of Burns. He afterwards lived for thirteen years at Sauchrie in Ayrshire, where he was in the commission of the peace and a deputy lieutenant. During this period, he enjoyed the society of his first wife—a lady named Nichol, whom he had married at New York, and who brought him three sons and three daughters. He married secondly, in 1827, Miss de Lancey.

In 1798, Mr Macadam received the government appointment of agent for victualling the navy in the western parts of Great Britain, and removed to Falmouth. He subsequently resided for many years at Bristol, and latterly at Hoddesdon in Hertfordshire. It was while acting as one of the trustees upon certain roads in Ayrshire, that he first turned his attention seriously to the mechanical principles involved in that branch of national economy. While engaged in England in duties of an entirely different kind, he continued silently to study the process of road-making in all its details, keeping particularly in view the great desiderata of a compact and durable substance and a smooth surface. By the exertions of various able engineers, who had turned their attention to road-making, the highways of Great Britain were already in the course of a rapid improvement; but Mr Macadam was the first to point out and prove, in practical operation, that a bed, of a few inches in depth, formed of fragments of primitive rock—granite, greenstone, or basalt—small enough to pass through a ring not larger than two inches and a half in diameter, was the best material for ordinary roads. His system, in its leading features, is so conspicuously displayed in the public eye, that any minute account of it would be superfluous. It was not till 1815, when on the borders of sixty, that he began to devote his whole mind to the business of road-making. Being then appointed surveyor-general of the Bristol roads, he had at length full opportunities of exemplifying his system, which he forthwith proceeded to do in a manner that attracted general attention, and caused it to be quickly followed throughout the whole kingdom. In 1823, he was examined before a committee of the House of Commons respecting the propriety of converting the ruble granite causeway of the principal thoroughfares, into a smooth pavement resembling those which he had already formed on the principal roads. He expressed himself as decidedly of opinion that such a change should be made: "I consider," said he, "that the expenses would be materially reduced; the convenience of passing over the surface would be generally facilitated, particularly in the leading streets; and the same weight of stone, now put upon those streets as pavement, would be obtained at infinitely less expense, in a different form, for the purpose of road-making." The consequence was, that, in London, Edinburgh, and Dublin, some of the principal lines of street, which had previously been remarkable for solidity of pavement, as well as the large sums that pavement had cost, were—to use a phrase already familiar to every ear—*Macadamised.* In introducing this improvement into British roads, Mr Macadam had spent several thousand pounds from his own resources. In 1825, he proved this expenditure before a committee of the House of Commons, when an equivalent sum was voted to him, besides an honorary tribute of two thousand pounds, in consideration of the public benefits resulting from his labours. The inadequacy of this remuneration is very striking, when contrasted with the merit of bringing into operation a mechanical improvement, the consequences of which, in saving animal labour, facilitating commercial intercourse, and rendering travelling easy, quiet, and pleasant, are beyond all calculation. Mr Macadam, however, never made money an object, but, on the contrary, rejected on principle many opportunities of gathering wealth, which his office as a superintendant opened up to him, and which many men of by no means blunt feelings as to professional propriety would have taken advantage of. He therefore died a poor, but, as he expressed himself, "at least an honest man." His decease took place, November 26, 1836, at Moffat. In private life he was as eminent for his amiable and upright character, as, in the world, for that sagacity and application which became the source of such important benefits to his fellow-creatures. Entirely devoid of selfish feeling, he was the charm of the private circle, by his gentle and polished manners, and the ease and promptitude with which he imparted the stores of a powerful and well-informed mind.

MACCLESFIELD; a town of England, in the county palatine of Cheshire, nineteen miles from Manchester, and 167 from London. It is situated at the border of the forest to which it gives name, at a short distance westward of the river Jordan or Bollin, which falls into the Mersey. It was incorporated by a charter of prince Edward, the son of Henry III., as earl of Chester, in 1261; and subsequent charters were bestowed on it by Edward

III. and other sovereigns. Under the new municipal act the town is governed by a mayor, twelve aldermen and thirty-six councillors—the corporate body being styled the "mayor, aldermen and burgesses of the borough of Macclesfield." The town is divided into six wards. A court leet for the hundred and forest of Macclesfield is held, and a court of record for the trial of civil causes, four times a year. The reform bill also confers upon Macclesfield, with the townships of Sutton and Hurdesfield, the privilege of sending two members to parliament. Macclesfield consists of four principal streets, diverging from the market-place. It is supplied with water conducted in pipes from the adjoining hills, and lighted with gas. The principal trade of the place formerly was the making of twist buttons; but this has been superseded by the manufacture of silk in its various textures; and the magnitude and number of the factories exhibit the extent to which this important and beautiful branch of trade is carried on. Every variety of silk article, from the narrowest ribbon to silk handkerchiefs, satins, and gros de Naples, is manufactured here; there are also several cotton factories at Macclesfield. The river Jordan, or Bollin, runs through the lower part of the town, and, though the stream is inconsiderable, it turns several mills. The vicinity of Macclesfield yields abundance of coal, slate and stone. A canal to the east of the town gives a water communication with Manchester, and, by means of the Grand Trunk canal, with London also. A railway communication with Stockport will afford still greater facilities of intercourse with Manchester and Liverpool; while the railway to Crewe, and another through Newcastle and the Potteries, both of which branch at Nether Alderley, about six miles hence, present means of transit to other large towns. Population of Macclesfield in 1801, 8743; in 1831, 23,129. United population of Macclesfield, Sutton, and Hurdesfield, in 1841, 24,137.

M'CULLOCH, JOHN, M.D. F.R.S., F.L.S., and F.G.S., an eminent mineralogist, was born in Guernsey, on the 6th of October, 1773. His family was, as the name imports, Scotch; their estate and baronial castle were at Cardoness, on the river Fleet, in Kirkcudbright. The first school he was sent to was the grammar school at Plympton; afterwards to one at Penzance; and thence, in 1787, to the grammar school at Lostwithiel, in Cornwall, where he remained for three years. From Lostwithiel he went, in 1790, to prosecute his medical studies at Edinburgh, where he obtained his diploma of physician at the early age of eighteen. He resided five years at Edinburgh, when, feeling that he was by far too young to be likely to commence private practice with success, he entered the artillery as assistant-surgeon. On the 5th of April, 1803, he accepted the situation of chemist to the ordnance, which was more particularly agreeable to him as it exempted him from taking the routine duty in the colonies. In 1807 he resided at Blackheath, and practised as a physician.

About the year 1811, the surveys in Scotland commenced, in which he was engaged. This compelled him to give up both his profession and the appointment under the board of ordnance. He never resumed his practice, though he was frequently consulted, and was ever ready to give his advice when called upon. The first business on which he was employed in Scotland, was in a search for stones adapted to the use of the government powder-mills. The second business on which he was employed, was an examination of the principal mountains, with a view to the repetition of the experiments that had been made at Schehallian on the density of the earth. The third had for its object the correction of the deviations of the plumb-line on the meridian of the trigonometrical survey. Whilst he was making these surveys, he was also employed in geological observations, and in collecting materials for a mineralogical map, as well for his own amusement and instruction, as with the hope that they would become useful to the country at some future time. In 1826 he was desired by goverment to complete the work he had thus begun; and this was the commencement of the last and most important public work in which he was engaged,—the mineralogical and geological survey of Scotland,—which was continued every summer from 1826 to 1832, when he completed it. He received from government for this survey £7000—a sum, not by any means too large for the services he rendered. Some of the fruits of his separate surveys are before the public. The first was "A Description of the Western Islands of Scotland, including the Isle of Man," &c. 2 vols. 8vo., with 1 vol. 4to. of plates. London and Edinburgh, 1819; Next, "A Geological Classification of Rocks, with Descriptive Synopses, comprising the Elements of Practical Geology." London, 1821, 1 vol. 8vo. Thirdly, "The Highlands and Western Isles of Scotland, in a Series of Letters to Sir Walter Scott, bart." London, 1824, 4 vols. 8vo. Fourthly, "A System of Geology, with a Theory of the Earth, and an Explanation of its Connection with the Sacred Records." London, 1831, 2 vols. 8vo. In addition to these larger works, which arose out of his employment, he published an account of Blair and Dunkeld, anonymously, in 1823; and contributed many papers both to the Edinburgh Encyclopedia, and to Brande's Journal, on various subjects connected with Scotland generally, or its rocks and minerals; besides others on different topics.

In 1821, Dr M'Culloch published a Treatise on the Art of making Wines, which reached to a fourth edition in 1829. Two other works of his appeared in 1827 and 1828. The first is entitled, "Malaria, an Essay on the Production and Propagation of this Poison, and on the Nature and Localities of the places by which it is produced," &c. 1 vol. 8vo. London. The second is "An Essay on the Remittent and Intermittent Diseases, including generally Marsh Fever and Neuralgia," &c. in 2 vols. 8vo. London. For some years, and till his death, he filled the situation of lecturer on chemistry and geology at the honourable East India Company's military establishment at Addiscombe. His appointment of physician in ordinary to prince Leopold dates from 1820. He married in the course of the summer of 1835, Miss White, whose family resided near Addiscombe. He was with her in Cornwall, on a visit to the Rev. John Buller, at St Just, when he fell out of a pony phaeton, by which, in addition to other injuries, his right leg was so shattered, that amputation became necessary. This accident terminated his life on the 21st August, 1835. Dr M'Culloch left a variety of unpublished papers, and among others a large work on Natural Theology. He was steady in his attachments, zealous to promote the interests of his friends, and ever ready to aid those who needed his assistance. He possessed very strong affections and acute sensibility. His manners were courteous; his conversation was rich, varied, and remarkable for its unaffected simplicity.

MACDONALD, John, formerly lieutenant-colonel of the royal Clan-Alpine regiment, was the only son of the celebrated Flora Macdonald, who so materially assisted prince Charles in evading the English soldiery, in 1746. It is stated in the account of the rebellion, published under the title of "Ascanius," that she was the daughter of Mr Macdonald, a tacksman or gentleman farmer, of Melton, in South Uist, and was, in 1746, about twenty-four years old. It is also said that her portrait was painted in London, in 1747, for commodore Smith, in whose ship she had been brought prisoner from Scotland. Mr Croker adds, in his edition of Boswell's Johnson, that he has not been able to trace that portrait; but it may be remarked that there are four prints of this celebrated lady: one a mezzotint, by M'Ardell, from A. Ramsay; another mezzotint, by J. Faber, 1747, from T. Hudson; and a third, engraved by Johnson; and a large portrait, published in 1827, by T. Lupton, from a painting by J. Goubaud. In Dr Johnson's letter to Mrs Thrale, in 1773, in which he describes his visit to Flora Macdonald, it is stated, "She and her husband are poor, and are going to try their fortune in America." Mr Croker remarks that they did emigrate to America; but returned to Skye, where she died, on the 4th of March, 1790, leaving a son, colonel John Macdonald; and a daughter, married to a Macleod in Skye. The son, John Macdonald, passed many years in the service of the East India Company, and attained the rank of captain in the corps of Engineers on the Bengal establishment. In the years 1794, 1795, and 1796, he carried on, at Bencoolen, in Sumatra, and at St Helena, a continued series of observations on the diurnal variation of the magnetic needle, which he communicated, in 1798, to the royal society, and which were afterwards published in the Philosophical Transactions. He was elected a fellow of the royal society in 1800. About that time he returned to England, and was appointed lieutenant-colonel of the royal Clan-Alpine regiment, and commandant of the royal Edinburgh artillery. He was for some time stationed in Ireland. In 1803 he published, in two volumes 12mo, "Rules and Regulations for the Field Exercise and Manœuvres of the French Infantry, issued Aug. 1, 1791; translated from the French, with explanatory notes, and illustrative references to the British and Prussian systems of Tactics," &c. In the following year, when he belonged to the 1st battalion of Cinque Ports volunteers, he published another similar work, entitled "The Experienced Officer; or, Instructions by the General of Division, Wimpffen, to his Sons, and to all young Men intended for the military profession; being a series of rules laid down by General Wimpffen, to enable officers of every rank to carry on war, in all its branches and descriptions, from the least important enterprises, and expeditions, to the decisive battles which involve the fate of empires. With notes, and an introduction." In 1807, being then chief Engineer at Fort Marlborough, he published two more volumes, translated from the French, with explanatory notes, of "Instructions for the Conduct of Infantry on actual Service." His last work of this nature was a translation of "The Formations and Manœuvres of Infantry, by the Chevalier Duteil," 1812, 12mo. In 1811, he published, in folio, an essay on harmonics, under the title of "A Treatise, explanatory of the Principles constituting the Practice and Theory of the Violoncello."

Another subject which colonel Macdonald for many years ardently pursued, was that of conveying intelligence by telegraphs. In 1808, he published in 8vo. "A Treatise on Telegraphic Communication, naval, military, and political." In this he proposes a new telegraphic system; and, in 1816, he issued a Telegraphic Dictionary, extending to 150,000 words, phrases, and sentences. The directors of the East India Company liberally granted £400 towards its publication; and the colonel received testimonials to the utility of his plans from Mr Secretary Barrow, of the admiralty, and Sir Harry Calvert, adjutant-general. But the most favourite subject of his scientific researches, was the magnetic Poles and the variation of the Magnet; which, as we have before noticed, was that of his first published labours in the Philosophical Transactions. On this topic he contributed no less than sixteen letters to the Gentleman's Magazine. To the same miscellany he also contributed a vast number of articles on various subjects. He died at Exeter, where he had resided for twelve or fifteen years, on the 16th August, 1831, aged seventy-two.

M'GAVIN, William, author of "The Protestant," a controversial work on the leading doctrines of the church of Rome, was born August 12th, 1773, on the farm of Darnlaw, in the parish of Auchinleck, Ayrshire, which his father held on lease from lord Auchinleck, and afterwards from his son James Boswell, the biographer of Johnson. A short attendance at the school of that parish, when about seven years of age, constituted the whole education of a regular kind, which he ever enjoyed. His parents having removed in 1783 to Paisley, and being in by no means affluent circumstances, he was sent at an early period of life to earn his bread as a draw-boy in one of the manufactories. Subsequently he tried weaving of silk, but eventually was led by his taste for reading to become apprentice to Mr John Neilson, printer and bookseller; a situation highly congenial to his taste, and which afforded him the means of cultivating his mind to a considerable extent. The duty of reading proof-sheets in his master's shop was the circumstance which first led him to study the English language carefully; and, considering the limited nature of his education, it is surprising that he should have been able to attract notice as an author under the age of twenty. In 1793, having left Mr Neilson's shop, he was found qualified to assist his elder brother in the management of a school, where writing, arithmetic, and mathematics were taught. Of this seminary he afterwards became sole master; but he ultimately abandoned teaching as a pursuit not agreeable to his genius or temper, and in 1798, was engaged as book-keeper and clerk by Mr David Lamb, an American cotton merchant, to whose two sons he at the same time acted as tutor. Some years afterwards, on Mr Lamb removing to America, Mr M'Gavin became his partner; the business was carried on in Glasgow. In 1805, Mr M'Gavin married Miss Isabella Campbell of Paisley. As his business was of a light nature, and Mrs M'Gavin brought him no children, he enjoyed more leisure for the cultivation of his mind than falls to the lot of most merchants in the busy capital of the west of Scotland. At a later period, after the death of his original patron, he entered into partnership with the son of that gentleman, and carried on what is called a West India business, under the firm of M'Gavin and Lamb. This ultimately proving unprofitable, he was induced, in 1822, to undertake the Glasgow agency of the British Linen Company's bank, which he conducted without intermission till his death. Being a man of uncommon industry, and equally great benevolence, Mr M'Gavin found time, amidst his numerous mercantile avocations, to write a number of religious tracts and stories, for the improvement of the poorer and junior classes of society. Though these productions are of a class which do not usually attain a high place in literature, no reader, however indifferent to the subjects, or of however highly cultivated intellect, could peruse them, without remarking the extraordinary conciseness of style and moral force by which they are characterized. The most distinguished of all Mr M'Gavin's writings is his "Protestant," a series of papers, designed to expose the errors of the church of Rome, commenced in 1818, and finished in 1822. These obtained a high degree of celebrity at the time of their publication, and are still held in great estimation. In 1827, he superintended a new and improved edition of "The Scots Worthies," to which he added notes. He soon after published a refutation of the peculiar views of Mr Cobbett in his History of the Reformation; and a similar exposure of the principles of Mr Robert Owen. He also published a pamphlet, entitled "Church Establishments considered: in a Series of Letters to a Covenanter." Not long before his death, he superintended a new and improved edition of Knox's History of the Reformation; and aided with an introduction, a work by the Rev. Mr John Brown of Whitburn, entitled "Memorials of the Nonconformist Ministers of the Seventeenth Century." In the midst of his divers labours, he suddenly died of apoplexy, Aug. 23, 1832.

MACHINERY, Effects of, (*a.* to article *Labour-Saving Machines.*) In the earliest ages of society, machinery was unknown. Man was created in a climate where the earth yielded bountifully at all seasons of the year, her productions for his use. Then, his only labour was to gather from nature's abundant store, the supply of his present want. Afterwards, he began to cultivate the soil, and then, probably, some simple instrument of culture was invented. At a still later period, his Creator invested him with dominion over the life of living creatures; and, to enable himself to exercise this new authority, he invented, also, rude instruments of hunting and fishing. These are all arts of absolute necessity. Without them, man could not exist, except in the mildest climates, and there only in small numbers. Beyond these arts, a large proportion of the human race have made no great advances. The only additional skill, yet attained by many tribes of the human family, —the skill to make rude clothing and to build rude huts to protect them from the inclemency of the weather,—has been taught them by stern necessity. In their circumstances, each individual of the society must labour for his own subsistence, and all hope of intellectual or moral improvement seems entirely cut off.

From time to time, however, in different parts of the world, there have been communities, which have risen far above this condition. Assyria, Persia, Egypt, Greece and Rome felt, by turns, the genial influence of improvement. And it is worthy of remark, that, wherever, over the whole earth, the light of civilization has once dawned, some rays of that light linger yet,—the utter darkness of absolute barbarism has never returned. It cannot wholly return. The law of man's nature, impressed on him by his God, is onward progress; and let a nation but once rise into the light of civilization, and then, however low adverse circumstances may afterwards thrust them down, they will never sink into utter night, nor will they ever cease to strive to re-ascend to day. It is also worthy of remark, as illustrative of this law, that these nations made different degrees of progress, and that each advanced farther in improvement than the preceding. The light shone faintest, where it first dawned, on Assyria,—its brightest effulgence illuminated Rome. It was a progressive illumination,—faint and hardly perceptible at first,—then gradually receiving greater and greater accessions of splendour. Now in our day, it has flashed out into a broad, bright, and glorious effulgence, encompassing and illuminating more than half the globe.

Civilization never takes place without the accumulation of the material products of labour. Different causes may produce this accumulation. The hand of violence may gather the spoils of rapine, and manual labour or mechanical contrivance may heap up the store of industry. The two first of these causes, but more particularly the first, procured an abundance of the necessaries and luxuries of life to the states of antiquity; and were, therefore, the principal agents in the work of civilizing those states. Mechanical contrivance exerted a similar, but, at first, almost imperceptible influence, increasing the stores of wealth, and thus helping forward the progress of civilization. The experiment of machinery, however, as a substitute for human labour, employed in producing and increasing the comforts of life, was never tried on a great scale by the nations of antiquity. That was reserved to be the distinction of modern times. The glory of compelling the powers of nature into the service of man, was destined to grace our own age. And, as the spoils of these bloodless victories have been far greater than ancient conquest ever gained,—as the accumulation of wealth, by the new agents that have been employed in the task, has been far more rapid than was ever known in former times, through the instrumentality of any agent whatever, so civilization has, in these latter days, spread far more widely, and penetrated much more deeply, than ever before; reaching, not one nation only, but many, and bestowing its invaluable benefits, not upon a favoured portion merely, but upon the whole of society. We would not say, that machinery has been the only efficient agent of modern civilization. We do not so believe. There have been moral agents at work. They have effected much; but without the aid of machinery, they could not have effected much. What we claim for machinery is, that it is in modern times by far the most efficient physical cause of human improvement; that it does for civilization, what conquest and human labour formerly did, and accomplishes incalculably more than they accomplished. And how different are the characters of these three agents! War, the direst curse of humanity, must necessarily precede conquest; and the structure of civilization, reared by this agent, rises upon the spoil, the desolation, and the anguish of the vanquished. Human labour, when urged to excessive efforts, must necessarily, to a considerable extent, prevent intel lectual and moral improvement. But machinery, doing the work, without feeling the wants of man; taking from none, yet giving to all, produces almost unmingled benefit, to an amount and extent, of which we have as yet, probably, but a very faint conception.

There are several objections to this general view of the effects of machinery, which we shall now examine. The first and principal one is, that, all labour-saving inventions diminish the demand for human industry, and consequently, deprive multitudes of labourers of employment. We meet this objection by denying the fact. It is not true, that the demand for human industry is diminished. It is not true, that multitudes of labourers are absolutely deprived of employment. It is true, however, that many labourers are sometimes compelled to change their employment, by the introduction of new and improved machinery into a branch of industry, where a great deal of human labour had been previously required. And it is true, that sometimes, while this change is in progress, a great deal of suffering is experienced. All this we shall attempt to explain.

The earth is the great primary source of the supply of human wants. It is the great laboratory, where the dust we tread upon is converted into life-sustaining nutriment. Whatever we eat, or drink, or wear, comes originally from her bosom. In the earliest stages of society, as has been already said, men consume her productions in their simple state. The springs supply them with water to drink. They eat the fruits of the field, and clothe themselves with leaves and skins. In this savage state, each one supplies his own wants, and it takes all his time to do it. But, after a while, some one more lazy or more ingenious than the rest, discovers some method of lightening his individual labour. Then others imitate him;—and, in time, machines are invented, that seem likely to supersede the necessity of human labour altogether. This would, in fact, be the result, if, in this condition of things, men should consume no more of the products of industry than before; and, of course, a multitude who had been actively employed would be employed no longer. But such is not the fact. The cravings of desire are never satisfied. Extend the supply as you may, the wish for the enjoyments of life will still go beyond it, and will find its only limit in the means of gratification. The only effect, therefore, of increasing the productive energies of labour, by the introduction of machinery, is to distribute it into more numerous departments. In the savage state, all were hunters and fishers; in the civilized state some cultivate the ground, some construct machines, some make clothing, some build houses, some make laws, and some preach sermons. Each fills his appropriate place, the amount and the products of human industry are incalculably increased, and the action of the great social system goes on safely and harmoniously.

The effect of machinery upon labour may be illustrated by an example. We will take the printing-press. It is difficult to conceive what was the condition of society, when there was no printing. We can almost as easily imagine the condition of the world, when there was no light. Yet we know that there was such a time. Then the copyist performed the printer's work. Books were published by copying them out with a pen. A considerable number of persons were employed in this business, and a considerable number more found employment in the preparation of the materials for copying. Books published in this way were, of course, very expensive. The whole annual income of a man in moderate circumstances would hardly buy a Bible. None but princes and very rich men could afford to purchase libraries. Hence, the demand for books was extremely limited, and the number of persons employed in furnishing them, must have been regulated by the state of the demand.

When the printing-press was introduced, an extensive change took place. Books were multiplied. The price fell. Readers became more numerous. The demand for information became more urgent. Knowledge began to diffuse her healing beams every where, and an impulse was given to society, that has ever since continued to grow in energy and power. But this is not the result,—though an important and a glorious one,—that claims our consideration now. What we would now press upon the attention of our readers, is the effect of this machinery upon human industry. Is there more or less of human labour employed in furnishing books, since the press has lent its mighty aid to the work, than before? Where was then one author, there are now, at least, one hundred. It has been calculated that in Germany, one out of every hundred of the whole population, is an author. Instead of a few hundred copyists, and a few hundred manufacturers of materials for copying, there are thousands and tens of thousands of persons, who obtain a living by making types, presses, and paper, by printing books, by binding them when they are printed, and by selling them when they are bound. It is no exaggeration to say, that this business employs many hundred times as much human labour, as it did before the printing-press was invented.

In this instance, then, the demand for human industry has not ceased nor diminished, but is greatly augmented in consequence of the introduction of machinery. Nor does it seem to be possible that any other effect than this can be produced, until every department of industry,—when industry shall have subdivided itself into the greatest possible number of departments, whether moral, intellectual, or physical,—shall be overstocked, and every want of man more than supplied. This can happen only when man shall cease to improve;—a period, to which no philanthropist would wish to look forward.

But if this be so, some may urge, why is it that almost every where, when machinery has been introduced on a large scale, the working classes have uniformly evinced dissatisfaction and hostility? Why did they destroy the spinning-jennies in Normandy, and the threshing machines in England? Why did the printers of Paris, after the revolution of 1830, go about destroying the steam-presses? Why did they petition the legislature, that their use might be prohibited by law? The obvious answer to all questions of this sort is, that the working classes, especially of Europe, are not apt to distinguish between present inconvenience and permanent evil. They are not very far-sighted. They do see and feel the drenching and pelting storm; but they do not see, even in remote anticipation, the renovated beauty of nature, when the storm has gone by. No well-informed person ever denied, that the introduction of machinery may occasion temporary inconvenience. If a man, who has been accustomed to employ twenty workmen, procure a machine, which, with the aid of one, will do the work of the twenty, nineteen, of course, must be deprived of employment. When this takes place on a small scale, the inconvenience is not great. The little labour that is turned out of its accustomed channels, is almost immediately absorbed by other employments. Every trace and vestige of evil at once disappears. When, however, the experiment is made on a grander scale,—when a great number of machines, superseding the necessity of a vast quantity of human labour, are suddenly brought into use, the consequences are more serious. A multitude of labourers are, at once, thrown out of work. They find it difficult to obtain other employment, and in fact are, in some measure, unfitted for it by their previous occupations. They have no resources but their labour. Their daily wages supply their daily sustenance. Want of work instantly reduces them to beggary; and sometimes, under these circumstances, their distress is great. The same effect is produced by over-production. A farmer may grow as much in one year, as he can dispose of in two. A manufacturer may, in like manner, have a superabundant stock of goods on his hands. Neither will be likely to go on producing at the same rate as before. Some of their workmen must be discharged; and then the same consequences follow, as upon the introduction of labour-saving machines. These consequences will be imperceptible, if the over-production be slight and partial; but if it be great and general, they will be plainly seen and deeply felt. Sometimes both the causes we have mentioned concur. Machinery substitutes bodies of iron, with souls of steam, to do the work of living men; and the prospect of immense gain stimulates production to such an excess, that the markets of the whole world are glutted. This was the case with the cotton manufacture in 1825. Almost the whole of the machinery employed in this manufacture, has been invented within the last fifty years. When it had been introduced into general use, the same effects upon human labour followed, as in the case of the printing-press. The price of cotton fabrics was reduced. The demand for consumption increased, and the supply was extended to meet the demand. Some, who had been accustomed to spin and weave at home, lost their work; but a greater number found employment in the factories. On the whole, the number of persons employed in this business, instead of diminishing, considerably increased. The inventions of 1816 had a great effect upon this state of things. Among other improvements, the power-loom was introduced. Requiring only the superintendence of a single individual, it performed the labour of numbers. Then, to use the language of another writer, "on every hand the living artisan was driven from his work-shop, to make room for a speedier inanimate one. The shuttle dropped from the fingers of the weaver, and fell into iron fingers, that could ply it faster." These improvements in machinery, of course, occasioned a good deal of inconvenience and distress among the workmen; and before these evils could be wholly cured by the natural operation of the causes which produced them, a heavier calamity was to happen. The manufacture, aided by the new inventions, went on with unabated,—with increased activity. The disproportion between the cost of production and the price of the manufactured article, gave immense profits. Millions were added to the millions already invested in the business. The production of the raw material kept pace with the extension of the manufacture. At length, the supply far exceeded the demand. The warehouses of the world were filled. Prices suddenly fell to half of what they were before. Multitudes were ruined. Thousands of families were reduced to beggary. Some manufacturers discharged a part of their workmen, while they retained the rest at reduced wages. Many ceased to struggle with the adverse torrent, and discharged all their hands, and shut up their factories. The distress that ensued may, perhaps, be imagined. We are not competent to describe it. To aid the conception of our readers, however, we will quote the language of one, who was an eye-witness of a scene of distress, occasioned by a similar, but slighter cause.

"Within a small distance of my house," says this person, "is a large manufactory, the machinery of which extends nearly half a mile. I passed by it one morning, after its operations were suspended, and was exceedingly affected by the sight. A little while before, it was all animation and industry, affording honourable means of livelihood to many thousands of my fellow-creatures. The silence that now pervaded it spoke more eloquently and impressively to my heart, than any language could possibly do; it was the silence of unmingled desolation. I visited a row of houses occupied by the workmen. The doors were used to be open, inviting the eye of the stranger to glance, as he went along, at their neatness, cleanliness, and felicity. Little groups of healthful children were accustomed to appear about the cottages, full of merriment and joy; and the inhabitants, strong and healthy, saluted you as they went by. But the scene was lamentably changed. The cottages were closed. The inhabitants could not bear to have it known that they were stripped of their little ornaments. No children played about the doors. The very plants that were trained up in their windows, had pined and died. One man only appeared, emaciated and ghastly, a frightful spectre, as if the sepulchre had sent forth its inhabitants, to fill with terror the abodes of the living."

It is not at all wonderful, that distress so sore as this should drive men to do what afterwards they are sorry for. Extreme misery impairs the moral sense. The distinctions of right and wrong are apt to be obscured and lost sight of, in the tumult and tempest of passion. Resentment is almost always blind. Its violence generally expends itself on the apparent cause of injury; while it seldom reaches the real cause. It so happened in this case. The labouring classes cried out against machinery, and some statesmen, too, joined in the cry, when the principal source,—by far the most fruitful source,—of calamity, was an imprudent and excessive production, stimulated by high prices. Even this, however, is but a transitory evil. The bright and cheering beams of prosperity are intercepted only by a temporary eclipse. They are not quenched. They are not extinguished. When production ceases to be profitable, a part of the industry employed in it will be withdrawn. When other employment is found for it, the distress will vanish. And this will take place in a longer or shorter time, according to the circumstances of the nation, and the amount of labour thrown out of employment. If machinery bear a part in occasioning distress, it also helps to remove it. If over-production do not irritate the wound, it will soon heal. The man who employs a machine, produces as much as he who employs living workmen. If there be a difference of expense in favour of the machinery, the former will make larger profits than the latter. He will grow rich faster. But he will not put his riches into a strong box. He will surround himself with additional comforts. He will employ a school-master. He will patronize the printer. He will travel and become better acquainted with his race. And thus, while he makes himself a far more useful and valuable member of society than before, he gives employment, in one way and another, to quite as much human industry, as his machine deprived of employment. Thus, from the same cause that produced partial evil, flows also universal good. The amount of productive industry of every sort is, in the end, vastly increased.

We will now say something of the more general effects of machinery: and first, of the vast accession which has been made to the productive energies of labour, and the consequent vast augmentation of the products of industry. The necessaries, the comforts, and the luxuries of life are now produced in unparalleled profusion. The effect of abundant supply is to make articles cheap. Every man can now provide for his wants, and the wants of those dependent on him, in a much easier way, and at a much cheaper rate, than ever before; and the happy consequences of this state of things are visible in the improved condition of all classes of civilized society. But it is not in this point of view, that we chiefly delight to contemplate the effects of machinery. Its influence on the physical condition of man is doubtless very great; but its influence on his intellectual condition is greater. Not only are men in general better fed, better clothed, and better lodged than formerly, but, what seems to us to be a matter of infinitely greater moment, they are far better taught than formerly. Machinery has released some from hand-work, who have applied themselves to head-work. Machinery has supplied them with the means of communicating the results of their industry to the world. Thought is no longer restricted to the narrow circle around the thinker. Machinery has furnished better methods of sending it abroad, than speech. Art has been called in to assist nature. The speaker yields to the writer. The tongue is vanquished by the pen. No power can long preserve, or extensively diffuse spoken words, however eloquent. Write them out and give them to the printer, and if they are worthy of it they will spread every where and live for ever. Formerly, Cicero thundered in the Roman forum, in the midst of the proud monuments of his country's victories, and surrounded on all sides by the altars of his religion, to an audience, that shuddered, and kindled, and quailed, and burned, as he spoke. But when his oration was ended, it was forgotten by the multitude. Some burning thought might be stamped upon the memory. It might pass into a proverb, and be handed down by tradition. But that would not transmit his fame to future times. Had not Cicero written his orations, we should have known little more of him, than that he was a great orator, and that he lived and died in the latter ages of the Roman republic. He did write them, however; but even then, how limited was the circulation, which the copyist alone could give them!

Very different is the case now. A great orator rises in parliament. Every word, as it falls from his lips, is caught and written down. Early the next morning, the press gives wings to his thoughts, and sends them abroad, by the aid of the multiplied machinery of conveyance, to traverse regions, and to kindle minds, where Cicero did not even dream that it was possible for man to exist. The epithet, "winged words," seems no longer Homeric, but familiar and common-place. In a fortnight, they reach New York. In less than a fortnight more, they are descending the Ohio and the Mississippi. In the mean time, they have been passing across the Channel, into France, Spain, and Germany, learning new languages as they rush along. They make the circuit of the world. They are heard in India, in Australia, and in the isles of the Pacific ocean. Thus a great thinker and speaker, without the press can do little, against it, nothing; but with its aid, he is like the sun, light radiates from him in all directions, and diffuses itself through space. It may be said of him, without hyperbole, that his words go into all the world, carrying with them a momentous influence for evil or for good. By the side of this tremendous energy, every other power becomes insignificant. It proceeds from mind, and acts upon mind, and it is the chief glory of machinery, that it conveys its impulses to the remotest quarters of the globe. And this power is not conferred only on the great orator and statesman, who stands conspicuously out from the mass of his fellow-men. It is shared, in different degrees, by all who have thoroughly awakened their own immortal energies of mind and spirit. It may emanate from the closet of the poorest student, and be of force to revolutionize an empire. It has been truly, as well as forcibly said, by Dr Channing, that "one great and kindling thought, from a retired and obscure man, may live when thrones are fallen, and the memory of those who filled them obliterated, and, like an undying fire, illuminate and quicken all future generations."

But not only has machinery set free from the necessity of labour, many to teach, but a far greater number to be taught. Let the machines, which now supply the wants of the nations, be destroyed, and it requires no prophetic skill to foresee, that, at the same time, the school-houses will be emptied. Let it be imagined, if any are able to imagine, that every machine, for the furtherance of the operations of labour, is destroyed, and that all memory of the mode of their construction is blotted from the mind, and then let us be told, whether we should not, almost at once, sink back into barbarism. Now, thousands are instructed, where one was formerly. Knowledge is diffused widely through all classes of society, and is yet to be diffused far more widely. An unprecedented demand for useful information is every where made. Through the instrumentality of the press, and the modern engines of swift conveyance, sympathies are established between individuals, and between communities of individuals, who entertain similar sentiments, though residing in opposite hemispheres. It is a remarkable illustration of this, that the friends of freedom and knowledge throughout the globe, seem now to constitute but one great party. Wherever a struggle is made for liberty, wherever a contest is begun with that worst of tyrants, ignorance,—that spot concentrates and fixes the attention of multitudes in every civilized nation. Unnumbered minds watch the progress of the contest, with deep anxiety. Thus a universal public opinion is formed. This opinion has strength in its own nature. It is spiritual, wide-reaching, and mighty. It dethrones kings, it abrogates laws, it changes customs. It is stronger than armies. Barriers and *cordons* cannot shut it out. Fortresses and citadels are no defence against it. It spreads every where, and conquers wherever it spreads. God grant, that it may continue to spread and to conquer, till every throne of tyranny shall be overturned, and every altar of superstition broken down!

But the most wonderful consequence resulting from the introduction of machinery is, that it has, to all intents and purposes, greatly prolonged the term of human existence. This is not fancy, but fact; not imagination, but reality. Human life should be measured by deeds, rather than by years. He lives long, who accomplishes much; and he lives longer than other men, who accomplishes more than they. And how much more can he accomplish, whose active existence is but beginning now, than was performed, or could have been performed by one, who lived fifty years ago! The multiplied facilities of intercourse, and the cunningly abbreviated methods of doing every thing at the present day, have introduced extraordinary despatch into all the operations of life, and increased a hundred fold the active power of each individual. Whole communities feel the power of these strong exciting influences. Not only are more important and numerous private acts performed by individuals, than have ever before been done in the compass of one life, but public events, more astonishing and of greater consequence, than were wont to happen in former times in the course of centuries, are now crowded into the history of a single generation. And when we look around us, and behold these strong agents of improvement, acting, at the present moment, with greater energy than ever, and producing every day still more wonderful results, we confess, we are filled with astonishment and admiration. We do not claim, as we have already said, for machinery, the sole agency in producing these magnificent effects. We know that they are principally owing to the operation of moral causes. But we say, that it is machinery, which has removed obstructions out of the way of their action, and brought them into contact with the objects on which they are to act; and that, without the aid of machinery, these causes, whatever inherent energy they might possess, could have produced little or no effect on the condition of society.

We have mentioned some of the general results, which machinery has contributed to produce. There is one particular consequence, that should never be forgotten when machinery is spoken of. It was the inventions of two mechanics, that carried England triumphantly through the contest with Napoleon. Arkwright invented a machine for spinning cotton, and Watt perfected the application of steam power to manufacturing purposes. These inventions conquered Bonaparte. They enabled Great Britain to manufacture for the world. Wealth flowed into her treasury in copious streams, from every quarter. With this wealth she maintained her own armies, and subsidized those of almost all the nations on the continent. She took the lead in the struggle that ensued, and maintained it, until the battle of Waterloo finally decided the fate of Napoleon and of Europe. These inventions made no great show. They attracted little of popular admiration. No laurels bound the brows of the inventors, though, in our esteem, they were far worthier of the laurel wreath, than the proudest conqueror that ever desolated the earth. Their names have not been blazoned in song. The historian honours them but with a cursory notice. Yet did these men, by their astonishing genius, confer on England power to control the issue of the most momentous and fearful struggle that ever put in peril the best interests of man.

How does machinery produce these almost miraculous results? How long have these strong influences been acting on society? A few words by way of answer to these questions, shall conclude this article. We have already remarked, that the invention of some machines of a simple construction, is dated far back in remote antiquity; but these were all helps to individual labour, and are never thought of now, when machinery is named. Then, almost every thing was done by hand. Navigation clung timidly to the shore. Labour performed its task tediously and imperfectly. Knowledge was diffused in scanty measures and by tedious processes. Human improvement advanced, if indeed it did advance, imperceptibly. It is but recently, that any great change has taken place. The era of machinery may be said to have commenced within the last fifty years. Man has called upon the unwearied powers of nature to bear his burdens, and they have obeyed the call. Whatever agency expands, contracts, impels, retards, uplifts, or depresses, is set at work. We confine elasticity in our watches, and bid it measure our time. With pulleys and levers, we compel gravitation to undo its own work. We arrest the water as it flows onward to the ocean. It must do so much spinning, so much weaving, or so much grinding, before it can be allowed to pass on. With the help of pumps and other machinery, we force the very atmosphere we live in, to raise our water from the wells and from the rivers, and to aid in an uncounted and countless variety of other operations. Last, and most wonderful of all, by the application of fire we transform water into that most potent of all agents, steam. Man, as it were, yokes the hostile elements of fire and water, and subjects them to his bidding. It is hardly a metaphor, to call steam the vital principle, the living soul of modern machinery. There is hardly any sort of work, in which this mighty agent may not be employed. It is equal to the vastest operations, and it will perform the most minute. It delves in the mines, it lifts the ore to the surface, and converts it into a thousand forms. It helps to make the engine, which it afterwards inhabits. It brings the cotton to the manufactory, picks it, cards it, spins it, weaves it, stamps it, and then distributes the fabrics for sale. It works on the land and on the water, on the rivers and on the seas. It is found on the Rhine and on the Danube, driving huge fabrics impetuously along through the echoing forests, and by the old castles of chivalrous ages, accustomed to behold far different scenes; and it performs on land the work of many thousand hands. Invention seems to rest from the effort to discover new forces, and to bend all her energies to multiply the applications of this. Friction and gravity alone continue to oppose the dominion of steam over space. Numberless subtle contrivances have been resorted to, to evade the power of these stubborn antagonists of motion. Railways are constructed, stretching over mountains and plains, linking together and making near neighbours of distant territories. Long trains of cars, moving on wheels so peculiarly constructed, that their friction is scarcely perceptible, are placed on them. The horse is unharnessed. He is too slow and too weak to perform the required service. At command, the whole moves, hurrying on, under the strong impulse of an invisible power, with a velocity that defies description. The lover need no longer pray for wings to bear him through the air. A railway car will bear him swifter than the swiftest wing. The exclamation of the poet no longer startles us. His description of the physical achievements of man's "genius, spirit, power," are no longer extravagant. It falls far short of the reality.

"Look down on Earth!—What seest thou?—Wondrous things!
Terrestrial wonders that eclipse the skies!
What lengths of laboured lands! What loaded seas!
Loaded by man for pleasure, wealth or war!
Seas, winds and planets, into service brought,
His art acknowledge, and subserve his ends.
Nor can the eternal rocks his will withstand;
What levelled mountains! and what lifted vales!
High through mid air, *here*, streams are taught to flow;
Whole rivers, *there*, laid by in basins, sleep,
Here, plains turn oceans; *there*, vast oceans join
Through kingdoms, channelled deep from shore to shore.
Earth's disembowelled! Measured are the skies!
Stars are detected in their deep recess!
Creation widens! Vanquished Nature yields!
Her secrets are extorted! *Art* prevails!
What monument of genius, spirit, power!"

This was a just description when it was written; and it describes splendid triumphs of the intellect over matter. Let our readers add it to all the wonders which have been achieved by steam, and they will have a tolerably accurate idea of what the mechanical powers have done, and are doing for man.

MACLEAN, Mrs. See *Landon, Letitia Elizabeth.*

MACNISH, Robert, LL.D., better known to Magazine readers by the cognomen which he assumed of "A Modern Pythagorean," was born in Jamaica street, Glasgow, on the 15th Feb., 1802. After receiving the elements of education partly in his native city, and partly at a classical academy in Hamilton under the charge of the Rev. Alexander Easton, he entered upon the study of medicine (both his grandfather and father being at the time respectable practitioners in Glasgow,) and at the early age of eighteen, having undergone his examination before the college of surgeons, he obtained the degree of master of surgery. He first practised in Caithness, for about eighteen months, as assistant to Dr Henderson there, and afterwards went to Paris, where he remained about a year, with the view of completing his medical studies. On his return to Scotland in 1825, he obtained his diploma from the faculty of physicians and surgeons of Glasgow, giving in, as his inaugural thesis, an essay on the Anatomy of Drunkenness. Two years afterwards, this essay was published at Glasgow in an extended form, and very favourably received. It was still further enlarged in subsequent editions, and has been translated into the German and French languages. Dr Macnish's first essays in literature were contributed to "The Literary Melange" and "The Emmet," two Glasgow periodicals, in the latter of which especially, though a publication of humble pretensions, some of his best pieces appeared. In 1826, he first opened up a communication with Blackwood's Magazine, by sending to it a tale entitled "The Metempsychosis," which appeared with the signature of "A Modern Pythagorean," a title which he continued to affix to all his after productions in that Magazine and other periodicals. In 1830, he published at Glasgow, a treatise entitled "The Philosophy of Sleep," which was equally well received with his Anatomy of Drunkenness, and has gone through several editions. In 1834 he published "The Book of Aphorisms," a number of which had originally appeared in Fraser's Magazine. In the same year he paid a visit to the continent, a visit which he repeated in the following year, embracing Belgium, France, Switzerland, Germany, and Holland in his tour. His last publication was a small treatise on Phrenology, to the doctrines of which he had become a zealous convert. Dr Macnish died of influenza, an epidemic then raging in Glasgow, on the 16th Jan. 1837, in his thirty-fifth year. In the following year a series of his tales, essays, and sketches, were published at Edinburgh, in two volumes, with a memoir of the author, by his friend, Dr Moir of Musselburgh. In private, he was much beloved for his happy temper, pleasing manners, and kindness of disposition. Though not tall, he was strongly formed, and greatly addicted to athletic exercises, carrying his attachment to these even to the point of eccentricity. Of his works, his treatises on Drunkenness and Sleep have been unequivocally stamped with public approval. His tales, sketches, &c. have also been well received, but of these it may be said generally, that, while they display considerable fancy and humour, the germ of them may be traced in the writings of his more distinguished contemporaries. Many of his stories, for example, are constructed on the principle of exciting a morbid curiosity regarding some unknown personage, which is not justified by circumstances, nor in the end even gratified. This, having been once done by Washington Irving, in his inimitable "Stout Gentleman," was one of those pieces of humour of too delicate a nature to bear repetition.

MACRIE, Thomas, D. D., a distinguished historical writer, was born at Dunse in Berwickshire, in the year 1772, and died, after a short illness, in his house at Newington, Edinburgh, on the 5th of August, 1835. He received his academical education in the university of Edinburgh, and studied divinity under Mr Archibald Bruce, minister at Whitburn, theological professor in connection with the General Associate (or Antiburgher) Synod. Having been licensed as a preacher by that body, he was at an early period of life ordained minister of a congregation in Edinburgh, in which he continued to labour ten years, applying with great assiduity to the discharge of his professional duties and occasionally publishing able pamphlets on some of the gravest and most difficult subjects of theological inquiry. In the year 1806 he felt himself conscientiously impelled to separate from the General Associate Synod (and indeed he was deposed from his charge by the authority of that judicatory), after having joined with Mr Bruce and others of his brethren in a protestation against the prevailing party "for having departed from some important doctrines of the Protestant churches, of the Westminster Confession of Faith, and of that particular testimony which they had subscribed." The chief ground of separation related to the powers and duties of the civil magistrate with respect to the public interests of religion. On this article, Messrs Bruce and Macrie, with the other ministers, who formed themselves into what was called the Constitutional Associate

Presbytery, maintained, in the most unqualified terms, the doctrines which had been originally held by the leaders of the reformation, both in this country and on the continent; and which are so clearly expounded in the systems of Calvin, Turretine, Voetius, Mark, and Pictet. In the examination of this question, Dr Macrie was irresistibly led to engage in a minute and patient survey of the writings of the reformers, and having at the same time been induced by domestic circumstances to pass much of his time in seclusion, he was gradually brought to form a most intimate acquaintance with the fundamental principles of the Protestant churches, and the characters of the illustrious men by whose labours and conflicts these churches had been constituted. In the year 1812 he published "The Life of John Knox," which not only gave a juster view of the character and conduct of that intrepid champion of Christian liberty than had ever before been exhibited, but shed a brighter lustre over some of the most obscure periods of our national history. This masterly work combined the highest excellences of which biography is susceptible, and at once placed its author in the first rank of historical writers. It was succeeded, after an interval of seven years, by "The Life of Andrew Melville," which, though possessing a less attractive title, is in no respect inferior to the life of Knox. It is indeed the more curious and instructive production of the two, abounding with an endless variety of facts illustrative of the progress of religion and learning not only in Scotland but in other nations. As Melville was the most active instrument in maturing the ecclesiastical constitution of his country, and introducing that efficient system of general and scriptural education which diffused such inestimable benefits over the whole mass of the population, the perusal of this work furnishes the surest means of becoming fully acquainted with all the peculiarities of the Presbyterian establishment, while it imparts a vast store of information, no where else to be found, on many collateral topics of the deepest interest. The subjects which are discussed by Dr Macrie in these volumes throw the most important light on the principles of religious establishments, a question which no man was more capable of solving, and which he was accustomed to treat in a manner more favourable to popular claims than speculative men in general have been accustomed to regard as being altogether consistent with the legitimate exercise of ecclesiastical authority, or with the implied alliance between the Church and any state in which republican principles do not predominate. Besides many valuable contributions to periodical publications, in which Dr Macrie gave additional proof of the inexhaustible amount of his historical learning, and of the singular acuteness and vigour of his mind, he published the following instructive works: "Memoirs of Mr William Veitch and George Brysson," Edinburgh, 1825—"History of the Progress and Suppression of the Reformation in Italy, in the sixteenth century," Edin. 1827,—and "History of the Progress and Suppression of the Reformation in Spain in the Sixteenth Century," Edin. 1829. For several years before his death, Dr Macrie was engaged in the preparation of a Life of Calvin. Through his own indefatigable industry, aided by the active and intelligent investigations of one of his sons, who spent many months at Geneva, he had accumulated such a mass of materials, and had made such progress in the composition, as to give good ground for expecting that the work will yet be given to the world. In private life, Dr Macrie was much beloved. To that native modesty and simplicity of disposition, which is the surest indication of a great mind, he added an unaffected kindness and cordiality which could not fail to gain the hearts of the youngest and most inexperienced of those who applied to him for counsel or for comfort. He was peculiarly accessible to all who were addicted to studies akin to his own, and was ever ready to refer them to the best sources of information. But amidst all his attentions to the claims of private friendship, and to the pursuits of that profound erudition, by the cultivation of which his health was impaired and his days shortened, he never lost sight of the paramount value of the pastoral office to which he had devoted his talents. From his early years his professional studies had been conducted with equal assiduity and judgment, and in every department of theological learning his reading was extensive, but especially in that most essential branch which furnishes the best aids for the skilful and profitable exposition of the Scriptures. In the illustration of divine truth he was at once perspicuous and faithful, and, without being ambitious of fame, his earnestness of manner gave an elevation and tenderness to his speech more capable both of captivating and bettering the heart, than the most admired specimens of artificial eloquence.

MADEIRA, and the AZORES, (*a*.) Madeira belongs to the Portuguese, and is situated in 17° of west longitude, and 32° 30′ of north latitude, off the western coast of Africa. It rises for the most part abruptly from the Atlantic, and its highest summit exceeds six thousand feet. Its picturesque and beautiful appearance has been often described. The air is loaded with perfumes, the large leaves of the banna wave over the walls, and the splendid palm trees overtop the houses. The coffee trees form hedges and copses, and the mimosas, protea, and a variety of the most gorgeous and fragrant plants, of which we see mere fragments in our hot-houses, here rise, says Von Buch, "to tall and stately trees, displaying their far glittering blossoms in the most delightful climate upon earth." Madeira is liberally supplied with rivulets and cascades, that leap from rock to rock, through bushes of rosemary, jessamine, laurel, and myrtle. Groves of chestnut and pine trees stretch out along the declivities of the mountains, and the air is filled with the warblings of thousands of canary birds from their branches.

"Named from her woods, with fragrant bowers adorned,
From fair Madeira's purple coast we turned.—
A shore so flowery, and so sweet an air,
Venus might build her dearest temple there."

The uniformity of the temperature of Madeira is almost unexampled. The average range of the thermometer, from the observations of an English physician long resident in Funchal, is from 68° to 76° of Fahrenheit during the summer, and from 57° to 65° in winter. The mean temperature deduced by Mr Bowdich from his observations was 66°. Every desirable variety of temperature can be enjoyed, with the accompanying changes in vegetation, until the continued snow is entered at the height of five thousand one hundred and forty-eight French feet. At this height the precipices and chasms are numerous, and many of them frightful and inaccessible.

Madeira has long been the resort of invalids, especially of consumptive patients. The most favourable season for them is from November to the middle of June. In July, August, and September, the heat occasionally becomes excessive, and the influence of the sirocco wind has been known to cause a rise of temperature to 130° of Fahrenheit, a heat sufficient to melt wax. The winters too are sometimes stormy and uncomfortable. The geological structure of the island unfortunately is an insuperable obstacle to the construction of roads, and the invalid is debarred from the salutary exercise of riding.

The *Azores* or *Western islands* are nine in number, and situated to the northwest of Madeira, between 37° and 39° of north latitude, and 25° and 31° of west longitude. The largest and most important is the island of St Michael's. It is about fifty miles in length, and its breadth varies from six to ten. It rises in many parts precipitously from the water, at others very gradually. Here are seen gently sloping and spreading declivities, and there a long line of elevated ridges, with huge angular buttresses of rock running up from their base, between which, narrow silvery streams of water are often dashing along, or unite to form a picturesque cascade. The more level parts are dotted with hundreds of small hills, many of which are perfect cones, while others are truncated, or terminate in crater-shaped summits. The lower parts of the island are cultivated, and exhibit extended fields of Indian corn, wheat, and the various culinary vegetables. Houses and villages are scattered all along the coast, intermixed with vineyards and orange gardens. The population is about eighty thousand.

Next in importance is the island of Fayal, which is of much smaller size, being but about fifty miles in circumference. It rises more abruptly from the water, but is not inferior in point of beauty. The capital of Fayal, Horta, is beautifully situated at the bottom of a semicircular bay, and at the foot of a grand amphitheatre of mountains. The mountains are clothed to their very summits with the myrtle and laurel, and a great variety of flowering shrubs. Gardens and orange groves, so thickly overgrown that scarce a sunbeam gains admission, are numerous, amid which are scattered the country seats, and occasionally a church or a convent. Some of these are very conspicuous and ornamental, from the elevated spots on which they have been erected, overlooking the city and anchorage. Pico is separated from Fayal only by a narrow channel, and rises immediately in front of the city; there are many houses upon it along the water's edge, and behind them are the vineyards, extending a considerable way up its acclivity,* out of which its blackened, burnt, scorified, and seamed mass towers aloft in imposing grandeur.

The city of Horta has an antique appearance, and its streets, compared even to those of Ponta Delgada, the capital of St Michael's, appear desolate and dreary. They are generally very narrow, wretchedly paved, and not lighted at night. But few persons are seen in them, except in the vicinity of the market-place and custom house. In Ponta Delgada, on the contrary, the streets are thronged with people, vehicles, and donkeys. The large and once splendid churches and convent in Horta are fast falling to decay, and some are entirely deserted.

The prosperity and growth of all the Azores have suffered as much probably from the want of good harbours, as from any other cause. Immediately on the arrival and anchoring of vessels at Horta, it is found necessary to render them more secure, by sending off in large boats from the shore additional anchors and cables; but even this is not always a sufficient protection from the fury of the wind and heavy seas, by which they are often driven from their moorings upon the craggy rocks of Pico or Fayal. The best harbour is at St Michael's, where, although vessels lie at anchor at the distance of half a mile from the city, they have a much better chance of getting to sea, in the event of a gale, than at Fayal. The construction of a safe harbour at St Michael's could be effected with no very great expense; for nature has already done much, and had the island belonged to Great Britain, it would long since have been accomplished. The Portuguese government are however said to have the matter under consideration, and some surveys have actually, we believe, been commenced.

The political changes in the mother country have not been without their effect upon the Azores. Very decided and obvious improvement has taken place, especially in St Michael's. The residence there of Don Pedro, during the contest with Don Miguel, was marked by some vigorous measures. The swarms of friars and nuns were put to flight, their rich territories were taken under the care of the crown, their cells transformed to hospitals and barrack-rooms, and some of their convent chapels converted into monitorial and other schools. One of the chapels is now a reading-room, well supplied with books, periodicals, and newspapers, but supported chiefly by the foreign merchants resident in Ponta Delgada, where two newspapers are moreover published. This is the only island in which an English church has been allowed to be erected, and a resting-place assigned for the repose of the ashes of protestants, which is a neat enclosure, already exhibiting several handsome monuments, and ornamented with trees and shrubbery. The intercourse with the more enlightened Portuguese who accompanied Don Pedro, and with the increasing numbers of English and American residents, has had a very perceptible influence on the before secluded, thick-blooded "morgardos";† and their children are now often sent to London, Lisbon, or Paris to be educated. Many new buildings have been erected in St Michael's, some in excellent taste and at enormous cost. New streets have been laid out, and various other improvements commenced. Much of the ceremony that was so great an obstacle to social intercourse, has given way, and females are actually seen in the streets unattended. The introduction of foreign articles of luxury or comfort is now very considerable, many of the shops in Ponta Delgada are well supplied with the fanciful wares of London and Paris, and the fair Portuguese are fast becoming proficients in all the mysteries of "shopping."

The progress of improvement in all these islands is still much impeded by the entail of estates, and the difficulty of purchasing land; but measures are understood to be in train to remove or modify these evils.

With the breaking up of the religious establishments, and the diminution of the influence of the priests, the people have become inattentive to their religious observances. Although the churches are open daily and mass is continued, few worshippers are seen in them. The pic-nic parties, in which the foreign residents so often unite, are accommodated without scruple in the village church, and the repast is allowed to be spread at the foot of the altar. The religious ceremonies and processions are actually ridiculed by those who are required by their office to take part in them.

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* These vineyards furnish all the wine that is exported under the name of Fayal wine.

† Proprietors of entailed estates.

The changes in the feelings and habits of the people are most observable in the large towns; they have as yet extended but little to the peasantry. One often meets with pretty fair specimens of this class among the drivers of the favourite animal, the donkey. These men travel on foot day after day with little food, always however with a pocket full of parched beans, with which and an occasional glass of sour wine from some village wine shop, indicated by the bush, they are content. Few or none of them taste animal food from one year to another; Indian corn bread, yams, and fish are their staple articles of diet. Even the pig that every cottager rears, goes to pay his rent; and his poultry, if he have any, is demanded by his landlord, or carried to market. Indian corn is so important to them, that its exportation has been often forcibly prevented by the people, until they were supplied at their own price.

The Azorean peasantry, although miserably poor, are cheerful and industrious. During the summer, night after night they are heard beating the flax on the large stone in front of the door of almost every cottage, until near morning, when a short respite is snatched from toil, to be resumed at the first dawn of light. Yet they are always happy. Their love of music and dancing, in which they are probably not excelled by any people, appears to be to them an unfailing resource. At certain seasons one can hardly pass the door of a cottage, without being arrested by the sounds of the rude guitar or *viola*. During the dance the man sings his extempore effusion of some fifteen or twenty lines, to the accompaniment of the instrument, which is continued by his partner, and by all the others in succession, occasionally enlivened with a melodious snap of the fingers. On the entrance of a stranger he is immediately welcomed in a stanza, and alluded to by each dancer in turn.

Geology.—Madeira was several years ago described by Von Buch, as consisting of beds which have been elevated above the level of the ocean by elastic fluids; but he did not notice any distinct craters. Mr Bennet found two craters, one on the eastern, and the other on the western side of the island, the largest being about four English miles in circumference. Mr Scrope, in his ingenious and valuable work on volcanoes, quotes Madeira as one of the many examples of islands composed chiefly of volcanic products, which have risen from below the sea, solely by subterranean expansion, without having been since augmented in height or bulk by the products of external ejections. Mr Bowdich's account leaves no doubt of the volcanic origin of Madeira, and he has described the tuff, scoriæ, pumice, and other volcanic products of which it consists. He found the tuff and scoriæ repeatedly alternating with a cellular basalt (lava ?), forming a bed or current, the direction of which was indicated by that of the oval or elongated cells. He also describes a compact and columnar variety of basalt, in many places covering the other strata, and itself here and there covered by fragments cemented by a yellow tuffa. In the centre of the island this was seen immediately incumbent on limestone, which Mr Bowdich considers as the fundamental rock, and the thickness of which is seven hundred feet. This limestone he refers to the transition series. Both this and all the other rocks are traversed by very numerous dykes of basalt. An elliptical funnel-shaped depression was observed about eighty feet above the sea, which was probably a crater of elevation. From Mr Bowdich's account, it presents every appearance of having been formed by a minor volcanic heave, which threw up vast blocks of the rock it rent from beneath the ocean, but did not eject any lava or contents of its own.

The island of Porto Santo appeared to the same observer to consist of tertiary sandstone and limestone, alternating with the volcanic strata. The lowest visible deposit is a calcareous tuffa, reaching to the height of sixteen hundred feet, and traversed by vertical dykes of basalt. The sandstone Mr Bowdich considered as of more recent origin than the volcanic deposit; and in the neighbouring island of Basco he saw the calcareous tuffa covered with beds of limestone a hundred feet above the level of the sea. Count Vargas professes his belief that the calcareous rock and basalt are contemporaneous. But the limestone abounds in shells, which, together with the relative position of the two rocks and other geological appearances, lead to the probable inference of the limestone being of more recent origin. The horizontality of the strata, both in this and some of the other islands, is opposed to the theory of elevation by violent volcanic action beneath a limited area; but the facts which have within a few years been brought to light, have relieved us from the necessity of resorting to this explanation. Our views in regard to volcanic action have been greatly modified, and we have been taught, that a gradual rise of land over a great extent of country has been and is going on. We think that evidence exists of such change in some of these islands.

The curious and highly interesting circumstances in regard to the elevation of the solid strata of the North of Europe, and in South America, are now familiar to geologists. There is now no doubt of the rise of land on the coast of Chili in 1822, and again in 1835 to the height of ten feet in some places. Indeed Mr Darwin observed evidence of a rise of fourteen feet about sixty miles south of Valparaiso, in the shells attached to the rock. Similar facts have further shown that the whole coast of the Pacific from Peru to Terra del Fuego has undergone this change of level. The parallel terraces, as at Coquimbo, which rise to the height of three hundred feet and more, have been found to be covered with seashells, indicating successive elevations. And this has not been effected by sudden and violent action only, but also by insensible degrees, as is now admitted to be the case in parts of Norway and Sweden, and in the island of Great Britain. The elevation of the coast of South America, which we believe first attracted notice, was attended with a terrific earthquake, but in the North of Europe along the coasts of the Bothnian Gulf the rise has been gradual, and unattended with any volcanic phenomena. Mr Lyell has recently examined the marks, cut in the rocks by the Swedish pilots under the direction of the Swedish academy in 1820, and found the level of the Baltic in calm weather several inches below them. He also found the level of the waters several feet below marks made seventy or a hundred years before. He obtained similar results in other places. He discovered deposits on the side of the Bothnian Gulf, between Stockholm and Gefle, containing fossil shells of the same species which now characterize the brackish waters of that sea. These occur at various elevations, of from one foot to a hundred feet, and sometimes reach fifty miles inland. The result of this examination induced Mr Lyell to declare his belief, that certain parts of Sweden are undergoing a gradual rise to the amount of two or three feet in a century.

The relative changes of level of the sea and dry land have been noticed in several other places, especially in the neighbourhood of Pozzuoli, of which M. Arago gave an account at the meeting of the academy of sciences on the 15th of May, 1837, together with the results of the observations of M. Capocci, director of the observatory at Naples. Mr Babbage has proposed an ingenious explanation of these phenomena, viz. the local changes of temperature in the lower strata of the earth; and has calculated that a change of 100° Fahrenheit that should affect a formation of sandstone to a depth of five miles, would cause an elevation at the surface to the extent of twenty-five feet.

The observations of Humboldt and Von Buch, have led them to the opinion, that in submarine eruptions, the strata previously forming the bottom of the sea are uniformly elevated. Hence it is easy to account for the presence of the limestone in these islands, and the occurrence in it of fossil shells and impressions. But in some, the limestone is of more recent origin.

The great lateral extension of many of the beds of lava in these islands is one of the many evidences of their having flowed under the pressure of the ocean, as has been remarked in Iceland, the Ferroe islands, and others whose submarine origin is admitted by all observers. Where volcanic action has broken out since the elevation, the craters, or lateral openings and dykes, are every where seen. In some of the beds of lava, the vesicles or air bubbles are of prodigious size, two or more feet in diameter, and those of smaller size are every where met with, even in the hardest and most compact lava, while that in which they are so numerous as to give the lava the spongiform and cellular aspect, occupies the sides of the hills or covers large tracts of surface. The hills and mountains with which the islands abound, marking the sites of eruptions, and the plateaux composed of compact lava and tuff, or covered by pumice and scorified fragments, with blocks of obsidian, still farther indicate a submarine origin, and render the resemblance to Iceland and the islands already referred to still more striking.

The interpositions of beds of scoriæ and tuffa, which are to be seen in the most distinct manner alternating with the beds of basaltic lava all along the coasts, in bold precipices, indicate a series of ejections at successive intervals. In some of the islands, high bluffs are composed entirely of very hard, light-coloured tuffa, which, as at Fayal, might be mistaken for sandstone; in other places detached masses rise in pinnacles above the waters, or have been cut through by the action of the waves, presenting the most picturesque appearance. Some of them are arched and the waters flow beneath.

Great changes on the surface are going on at this day. Within the recollection of many of the inhabitants, torrents of water have rushed from the mountains, carrying destruction in their course, overwhelming cottages and cultivated spots with huge masses of rocks, pumice, and loose earth. There is one spot in St Michael's, several acres in extent, which was verdant and cultivated, until on a sudden the whole surface was covered with huge fragments borne down in the course of one night, and it is now a barren waste of loose rocks. In another spot, on the side of a deep ravine, at the bottom of which flowed a small stream, an enormous mass of pumice, an acre or two in extent and several hundred feet in thickness, suddenly separated from the main body, which formed an extensive plain, and fell into the ravine, leaving a yawning and frightful chasm. In Madeira these destructive effects have been more common and terrific than in the Azores. The effect of a most frightful flood, which occurred in 1803, has been described by an eyewitness, when such a swelling of the rivers took place, that they shortly rose and overflowed their banks, rushing down the declivities, and sweeping away whole vineyards and plantations, cattle, wine, stores, and the houses of the inhabitants, who, with their whole families, perished. Rocks of enormous size, as well as the largest trees, torn up by the roots, were carried from the mountains to the sea. The vestiges of this dreadful flood are still to be seen. A crater, said to be about three quarters of a mile in circumference, had a segment of its larger circumference, with the trees growing upon it, borne down into the bottom of the crater. In the town of Funchal, whole lines of houses with their inmates were swept into the sea, churches, bridges, and edifices of every description were involved in the same general wreck. It was computed that no less than three hundred persons perished.

The action of the waves is continually producing changes along all the coasts, the interposed beds of tuff and cinders are washed away, and the compact beds of lava being left unsupported, fall. The shores are strewed with huge blocks and fragments of all sizes.

Did not the geological structure of the islands furnish abundant evidence of volcanic action, we find it on record in the islands, and in one of the earliest works, that eruptions and earthquakes have occurred at various times, as well within the recollection of living witnesses as at earlier periods.

The first earthquake of which we have been able to find any record was on the 25th of October, in the year 1522, when five thousand persons were destroyed. It occurred at daylight, and was particularly violent in the district of Fanaes da Ajuda and Maia, on the north coast of St Michael's. It extended to a considerable distance, nearly destroying the large city and port of Villa Franca. A large part of the town was laid in ruins, and the Franciscan convent and other buildings were overwhelmed by a torrent of ashes and mud which has since become consolidated into a compact tuffa. Although the destruction of this place is now always attributed, by the present inhabitants, to an earthquake, it is beyond doubt than an eruption took place, of which we find traces in the compact lava covering the tuff and running out into the sea, forming indeed a wall with points here and there appearing above water, and resembling somewhat a coral reef, in front of the town. There is also in front of the town an island of tuff in distinct strata, dipping towards the interior in the form of a washing basin.

In 1563, on the 25th of June, the whole island of St Michael's was convulsed with an earthquake, which was most seriously felt in the neighbourhood of Ribeira Grande. An eruption appears to have taken place near the centre of the island; and the hill formed, which has now the name of Mount Vultur, exhibits abundant evidence of this event. The lava flowed in a current chiefly to the west, and covered Cabuco with porous lava; a tract which still remains uncultivated. At this time a large crater, called Lagoa do Fogo (or Lake of fire), twelve and a half fathoms deep, was formed.

An eruption also occurred on the 2d of September, 1630, in the valley of the Furnas, and the spot is now a nearly circular plain surrounding a somewhat high hill with a crater at top. At this time the cinders were carried nearly ninety leagues, as far as Terceira.

Since then other eruptions of minor importance have taken place from the same spot. On the 10th of October, 1652, the elevated Pico do Fogo was raised, and on the 19th of the same month, the hill called Pico de Jao Ramos, northeast of Lugar de Rosto de Cao in St Michael's. July 3d, 1638, was an eruption from the sea off Pico das Camarhinas, at the distance of one league from land, and where there were forty fathoms of water. In 1691, there was an eruption off St Michael's, and another in 1720, producing an island six miles in circumference. Many earthquakes occurred in the autumn of 1810. On the 1st of February, 1811, was an eruption off Genetes; and on June 13th occurred another, about a mile from the island of St Michael's, which elevated the island called Sabrina. The same phenomena have since occasionally recurred, but there has been no actual volcanic eruption in St Michael's. In the island of St George a destructive eruption happened in 1808.

In a word, all the geological phenomena, which have been remarked, lead to one and the same inference in regard to the volcanic origin and causes of the present aspect of these islands. Indeed, not only Madeira and the Azores, but also the Cape de Verds and Canaries seem to have had a similar origin.

MADISON, James, the fourth president of the United States, was the son of James Madison of Orange County, and was born on the Rappahannock river in Virginia, March 16th, 1751. He studied the English, Latin, Greek, French, and Italian languages, and was fitted for college under the instruction of Mr Robertson, a Scotchman, and the Rev. Mr Martin, a Jerseyman; was graduated at Princeton, N. J., in 1771; and afterwards remained a year at College, pursuing his studies under the superintendence of Dr Witherspoon, the president. His constitution was impaired by his close application to his studies, and his health was, for many years, feeble. In 1776, he was elected a member of the General Assembly of Virginia; in 1778, of the Executive Council; in the winter of 1779—80, of the Continental Congress, of which he continued a member till 1784; in 1787, a member of Congress, and in the same year, a delegate to the Convention at Philadelphia, which formed the present constitution of the United States. He continued a distinguished member of Congress till March 1797, the end of Washington's administration. On the accession of Mr Jefferson to the presidency in 1801, Mr Madison was appointed secretary of state, which office he held during the eight years of Mr Jefferson's administration; and in 1809, he succeeded his friend and coadjutor as president of the United States. After having filled the office for two terms, he retired to his seat, Montpelier, where he passed his remaining years chiefly as a private citizen, declining political office, except that he acted as visitor and rector of the university of Virginia, and as a member of the State Convention to amend the constitution of Virginia. He was distinguished for his great talents and acquirements, for the important offices which he filled, and for his virtues in private life. He died on the 28th June, 1836. Mr Madison was the last surviving member of the convention that formed the constitution of the United States; he was one of its most distinguished champions, and at the time of its adoption he was associated with Hamilton and Jay in the production of the celebrated work entitled the "Federalist." He left, in manuscript, "A careful and extended Report of the Proceedings and Discussions" of the convention of 1787, which framed the constitution of the United States, which he directed in his will to be published under the authority and direction of his widow.

MAGEE, William, D. D., archbishop of Dublin, and primate of Ireland. This distinguished prelate was the son of parents in very humble life, and was a sizer in Trinity college, Dublin, of which he afterwards became a distinguished ornament. He was for some time assistant professor of oriental tongues and professor of mathematics. His celebrated "Discourses on the Scriptural Doctrine of the Atonement and Sacrifice" were first published in 1801, in two vols. 8vo. His other publications consist of one or two occasional sermons, and a memoir of Thomas Percival, M.D. In 1813, Dr Magee was advanced to the deanery of Cork; in 1819, he was consecrated bishop of Raphoe, and in 1822 he was translated to the see of Dublin. He died on the 18th August, 1831, aged 66.

MAHMOUD II. (*a.*) The sultan Mahmoud II. died at Constantinople, on the 30th June, 1839, aged fifty-four. He was succeeded by his son, Abdul Medjid, who was born on the 20th April, 1823.

MAIDSTONE; the county and assize town of Kent, is situated on the river Medway, thirty-two miles S.E. by E. from London. The town consists of four principal streets and several smaller ones, which are well paved and lighted with gas. Among the public buildings are the county hall, the gaol, erected in 1818, and distinguished for the excellence of its plan and arrangements; the barracks, built chiefly of timber, and standing at a short distance from the gaol; the county ball-rooms erected in 1819; and the theatre, a small but neat structure. In the centre of the town is a handsome building, the lower part of which is appropriated for the corn-market; and behind it is a market-place commodiously laid out for the sale of provisions. The river Medway is here navigable, and a considerable trade is carried on with the metropolis. The imports consist chiefly of coal, timber, iron and rags; the exports of fruit, hops, stone, and paper. The chief manufacture is that of paper, there being in the neighbourhood several paper-mills, which afford employment for a great number of persons. The paper manufactured is of the finest kind, and its whiteness is attributed to the character of the water. Maidstone has returned two members to parliament ever since the reign of Edward VI., and it continues to do so under the reform bill. By the corporation bill of 1835, the town was divided into three wards, and is governed by six aldermen and eighteen councillors. Population in 1841, 18,086.

MALIBRAN. See *Beriot, Madam Malibran de.*

MALLOW; a town in the south of Ireland, in the county of Cork, situated on the banks of the Blackwater, on the mail coach road between Cork and Limerick, 163 miles S. by W. from Dublin. It is much resorted to in summer on account of its mineral waters, which are considered peculiarly efficacious in scrofulous and consumptive cases, and the properties of which are nearly the same as those of Clifton in England. The spa-house was built in 1828 by the lord of the manor, C. D. O. Jephson, Esq. M. P. The surrounding district is noted for beauty and fertility, and abounds in gentlemen's seats. The town enjoys a good retail trade, and is thriving. Population 9965 within the limits of the parish, including the suburbs of Ballydaheen.

MALMESBURY; an ancient town of England, situated at the north-west extremity of Wiltshire, ninety-five miles W. by N. from London. It is almost surrounded by two streams, the Newnton Water and the Avon. These streams unite near the town, and form what is termed the Lower Avon, which runs into the Severn below Bristol. Malmesbury derived its ancient splendour from its ecclesiastical institutions. The abbey, once a magnificent structure, was founded in the seventh century; it was originally a religious house or monastic retreat for a few recluses, until by grants and donations it became a stately abbey. The buildings are said to have occupied a space of forty-five acres, including the gardens and offices belonging to the monks. The town contains many relics of its monastic glory, but they have either been converted into dwelling-houses, and altered from their original appearance, or they are mere fragments, with the exception of the Abbey Church, the remains of the nave of which have been repaired, and rendered fit to be used for public worship. Near the centre of the town is the market-cross, which appears to have been built in the reign of Henry VII.; it is a beautiful octangular stone edifice, with flying buttresses and a richly ornamented turret, which is also octangular, with a small niche on each side, filled with figures, in basso-relievo, one of which represents the Crucifixion. Malmesbury was one of the earliest incorporated boroughs of England, and was also early distinguished as a place of trade. It is now, however, considered on the decline. It formerly returned two members to parliament, but by the reform bill now elects only one. Population in 1841, 2367. William of Malmesbury, the monkish historian, resided in the abbey here, and Hobbes, the celebrated metaphysician, was a native of the town.

MALTA,[*] (*a.*) the most southerly island in Europe,[†] is in the parallel (Valletta Observatory) of 35° 53′ north, and in the meridian of 14° 30′ 35″ east of Greenwich. The shape is an irregular oval, which has been compared by some to a fish—its southern aspect resembling the back, the bay of Marsa Sirocco the mouth, the various indentations on the north aspect the ventral fins, and the deep indentation of the bay of Melleha, with a corresponding indentation at the back of the island, the tail;—the island, in fact, stretches east and west, and is much indented with bays and inlets of the sea on the side which corresponds with the coast of Sicily, while that which looks towards the African coast is nearly a continued curve. The extreme length of the island is stated by Dr Hennen at eighteeen to twenty miles, and its greatest breadth from north to south ten to twelve miles, and circumference sixty to seventy; but a chart of the islands under the British crown, drawn up at the colonial office, makes the extreme length sixteen and three quarter miles, extreme breadth nine, with an area of ninety-five square miles. The same document makes Gozo (the island adjacent to Malta, and under the same government) nine and three quarter miles extreme length, five and one third breadth, with an area of twenty-seven square miles. Malta is distant from Cape Passaro the nearest point of Sicily, north, fifty-six miles, and Cape Bon, the nearest point of the African continent, is almost two hundred miles distant in a south-west direction. It is bounded on the east by the island of Candia, on the west by the islets of Pantelleria, Linosa, and Lampedusa, on the north by Sicily, and on the south by Tripoli. The sea dividing Malta from Sicily is only eighty fathoms deep in the middle or deepest part, very shallow in other places, and the bottom sandy; it is called the canal of Malta, and is generally rough, with strong currents setting through it on the north-west side towards the east-south-east, and on the east-south-east side towards the east. Gozo Isle, originally known under the name of "Gaulos" by the Greeks, "Gaulum" by the Romans, and by corruption in the Arabic language "Gaudese," which in process of time was Italianized into Gozo (pronounced Godso), is situate on the westward of Malta, distant from thence in its nearest point about three miles, though some parts of the strait is five miles broad. In the channel lies the small islet of Comino, formerly called "Hephostia," of an oblong shape, and about five miles in circumference, with a still smaller islet or rock called *Cominetto*, off its north-west extremity. Malta, comparatively speaking, is low, the highest land being estimated at no more than 1200 feet above the level of the sea, and cannot be discerned until the mariner approaches within twenty to thirty miles off the shore. The hill and dale surface is beautifully diversified, and the natural industry of the Maltese has converted an apparently barren rock into a very picturesque country. As a general feature, it may be observed, that the island is furrowed with valleys running from south-west to north-east, parallel to each other, and becoming longer and deeper as they extend from the eastern and western extremity. One, termed Melleha, nearly divides Malta into two parts; the most fertile, however, is the vale, which forms at its lowest extremity the port of Valletta.

A small range of hills and craggy rocks, called the Ben Jemma Hills, bearing a north-west direction from Valletta, stretch across the entire breadth of the island, and from these different spurs branch off, giving variety to the landscape. The southern shore consists of high or shelving rocks, without creeks or ports, or where a landing could be effected. To the east there is the port of Marsa (*Marsa*, in Arabic, signifies port or harbour) Scala, and towards the south-west that of Marsa Sirocco, capable of containing a great number of vessels. On the west there are two bays, called Antifaga and Magiarro.

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[*] Abridged from "The British Colonial Library, By R. Montgomery Martin, vol. vii. London, 1837," 12mo.

[†] The island was formerly placed by all geographers in Africa, but was declared to be in Europe, as regards the service of our soldiery, by a British act of Parliament.

The port of St Paul is on the coast opposite Sicily, and is so called from a tradition that the vessel in which St Paul was sent prisoner to Rome was driven in thither by a storm. St George's port, towards the north, is not far distant from that of St Paul, St Julian's bay is on the same shore.

Directly facing Cape Passaro are the two most considerable ports; that to the left termed Marsa Musceit, in the midst of which is a small island where quarantine is performed; the other, situate to the east, is called the Great Harbour. These two are separated by a tongue of land, on which the city of Valetta is built, the extreme point having on it the castle of St Elmo, which defends the entrance of both ports. Projecting into the Great Harbour are two parallel points of land, shaped somewhat like two fingers: on one is built the castle of St Angelo, nearest the entrance of the port, with the Burgh (il Borgo) to the eastward; on the other equally small peninsula is the fortress of *La Sangle*, which divides the *Galley* Port from the *French* Port. Fort St Michael is on the land side, and defends the two ports of *La Sangle*.

Città Vittoriosa, or Borgo, is built on the same point of land as the castle of St Angelo, but separated from it by a wet ditch. It has a line of works on its land front, extending from the Galley Port to Calcara Bay.

La Sangle, or Isola, is built on the other point of land, having its land front covered in a similar manner to that of Vittoriosa, by a line of works extending from the Galley Port to the French Port.

More in the rear of La Sangle than St Angelo is the city of Cospicua, or Burmola, commanded by St Margaret's Hill, on which is a fort of the same name, and covered to the eastward by a continued line of works, called Fiorenzola. Still further in the rear, and forming a crescent, joined at either end to La Sangle and St Angelo fortifications, are the strong Cotoner lines, consisting of a succession of bastions without any advanced works, which were intended to be effected, but circumstances prevented their completion. By sweeping round the French Port to Calcara Bay, towards the interior of the country, a considerable space is left in front of the St Margarita lines, which is intended to afford shelter to the inhabitants in the event of the island being attacked. The two points of land which jut out to meet the promontory on which St Elmo Castle is built, are also strongly fortified. The one, Fort Ricasoli, which is very large, but irregularly built, this, in conjunction with Fort St Elmo, defends completely the entrance of the Great Harbour; the other, Fort Tigné, protects Marsa Musceit Harbour, which is also further guarded by Fort Manoel, which is built on the quarantine island before adverted to. This fort is regularly and beautifully built, has five bastions, a half moon, and a covert-way: it is mined.

In addition to these powerful works, Valletta is effectually protected on the southward or land side, where the neck of the peninsula joins the main, by the fortifications termed La Floriana, a line of works extending from the great Port to that of Marsa Musceit, and in advance of which, on the side near the great Port, there is a beautiful crowned horn-work, with a covered way.

The Floriana constitute five successive lines, any one of which, well manned, would be sufficient for defence. The ditches in some instances are ninety feet deep, and excavated in the solid rock; the greater part of the ramparts being in like manner formed by hewing the rocks into the required shapes. Thus Valetta city is protected on three sides by the waters of the harbour, which no hostile fleet could enter without being immediately blown to atoms: the batteries of St Angelo, for instance, rising in four tiers of very heavy metal, a single discharge from which would sink the largest vessel. The entrance to the port is still further secured by an enormous chain or chains, capable of resisting the shock of any force that may be brought to bear on them. These extraordinary, and, it may be added, impregnable works, are the result of continued and unremitting exertions for upwards of two centuries.

The old city stands upon a hill which overlooks the whole country as far as La Valetta; it has a front, with a ditch and covered way. Above the top of the hills which cross the island and separate the inhabited and cultivated parts of Malta from the remainder, a wall five feet thick was erected by the knights as a retreat for the troops to fall back on if unable to prevent the landing of an enemy. Forts and batteries were also erected at ports St Paul and Marsa Sirocco, which would place a vessel attempting to anchor under a cross fire; and towers and redoubts were erected along the whole coast in such a manner as to communicate almost immediately with each other. The lines also are of immense strength, enclosing the various quarters of the capital for the space of a square mile and a half, and forming works of such extent and intricacy, that it is said 25,000 men would be required to man them in their full extent, when they might well be deemed impregnable. The French had but 6000 men to defend them, and yet could only be reduced by famine. Upwards of 1000 pieces of cannon were mounted on all the works, and Bonaparte entertained so confirmed an opinion of the strength of the place, that when he was asked on his departure for Egypt to give instructions relative to the defence of the garrison and fortifications, he told the officer in command (Vaubois) *to lock the gates and put the key in his pocket.* In fine, it may be said that Malta is as defensible as nature and art combined can render it. To sit down regularly before Valetta and its surrounding fortifications would require a well appointed army of many thousand men; and if the fortress were well manned and provided, there can be no estimate formed of the time it would hold out, as the besiegers, in addition to their land forces, ought to be able to blockade the port and command the dominion of the Mediterranean.

La Valetta, the modern and chief city of the island, founded by the celebrated grand master of that name in 1566, and completed in 1571, may be considered one of the finest towns in Europe; the kings of France, Spain, and Portugal, the Pope, and all the knights who resided out of

Malta, having contributed munificently towards its erection. The neck of land or promontory on which it stands (originally called Mount Sceberras) divides the main harbour (Great Port) from Marsa Musceit haven, where the shipping perform quarantine. The neck is estimated at 3200 yards long, by 1200 broad, descending by a gradual slope. Its whole length, from the land barrier at the southern extremity to the point of St Elmo, which terminates in the Mediterranean in a narrow point of about 300 yards, bearing north-east by north, on which point the citadel and lighthouse of St Elmo are built. The centre of this neck of land is its highest point, whence it gradually slopes to the water's edge at either side. The longer streets, eight in number, run in parallel lines along this ridge or "hog's back" from south to north, or, more strictly speaking, from south-south-west to north-north-east, and are intersected by shorter streets, eleven in number, which run from one harbour to another up the sides of the ridge. Besides these regular streets, rows of houses front the works all round, a carriage space being left between them. The thoroughfares afford an excellent means of ventilation, while the gradual descent towards the sea on all sides facilitates the removal of all nuisances. The public buildings and private dwellings are of a very superior order, the latter being inferior to those of no other city. The houses are of solid stone, with flat or terraced roofs, composed of stone slabs, covered over with a thick bed of "terras," or "puzzolana," so as to be impenetrable to rain, and, as in Calcutta and other parts of the east, affording a cool and agreeable morning and evening promenade. Very little wood is employed, the stair cases, floors, &c., being of stone. The lower parts of the houses are used for shops, stores, or habitations for the poorer classes. Between the ground and first floor is a "mezzanino" or middle floor, rarely exceeding seven or eight feet in height, and frequently used as bed-rooms or eating apartments; the principal suite of apartments being on the first floor. Each house has generally a court, with a tank or large well, and into this court the apartments of the principal chambers look. A house fit for a moderate family, containing twelve or fourteen apartments, may be rented at £20 per annum, and an equally commodious house and garden in the country for half that sum. The paving and lighting of Valletta are excellent: the principal streets are formed with flags cut out of the hardest pieces of native stone, or with blocks of lava from Mount Etna, and a regularly raised footway runs on either side. Water is supplied by means of an aqueduct (17,000 yards long) the quantity introduced being fifty-eight gallons per minute. In order to extend the supply of this indispensable aliment, every house is furnished with a tank, into which baked earthen pipes convey the rain water from the flat roofs, and wells and cisterns are sunk in every possible situation. The buildings appropriated for Government are admirable, and the palace of the governor is suited for the residence of a crowned head.

Gozo (or Gaudisch, as the natives call it) is separated from Malta by an arm of the sea, four to five miles wide; with an average length of eight miles, by six broad, and twenty in circumference; although fertile and thickly inhabited, it contains no town, the inhabitants being scattered in six villages, protected by a strong fort, Rabato, in the centre of the island. The surface of the island is very agreeably diversified with hill and dale, some of the more elevated parts in the north-west being nearly 2000 feet above the sea. A chain of these elevations encircle the island, embracing a beautiful series of fertile valleys, separated by gently rising grounds; the summits of some of the mountains are flattened, and truly table lands; others are rounded or mammillary; and there are four or five remarkable detached hills, perfectly conical in shape, and presenting the appearance of old volcanic productions. The interior of the island and its shores abound in caves and rocks, being of the same calcareous nature as those of Malta, but the country is much more rural and agreeable. Fort Chambray, commenced in 1749, contains the principal accommodation for troops; it lies on the south-east side of the island, and is built upon an elevated promontory, forming one side of a little bay in which the Malta boats anchor; the shore all round is very bold, especially to the south, where it rises into rugged and inaccessible cliffs, with huge masses of rock broken off from them and projecting into the sea; the road gradually winds from the sea to the fort (which is 500 feet above the shore) after a circuit of about 700 yards; the area on which the fortification is built being about 2500 feet in circumference. The barracks accommodate 250 men, are admirably arranged, and there is a small but excellent hospital attached. The lieutenant governor resides near Migiarro, a small and insecure port, but the only one which the island possesses. A constant intercourse is kept up with Malta, the distance to Valetta by sea being eighteen miles, although the two islands are within four miles of each other. The oblong islet of Comino, two miles in length, lying between the larger islands, has a few inhabitants, employed in cultivating about thirty acres of land, and in preserving the numerous rabbits with which the island abounds. Besides Cominetto, which lies off the north-west end of Comino, there are four or five other islets, or rather rocks, belonging to Malta and Gozo.

Climate.—The climate of Malta is decidedly warm, indeed, almost tropical. The *maximum* temperature for the year may be taken at 90° F., the *minimum* at 46°, and the mean at 63° F. The barometer may be similarly quoted at 38° 8′, 30° 2′. and 30° 5′. The hygrometer 87°, 30°, and 58½°. The heat of the summer is doubtless increased by radiation of the solar rays from the rocks surrounding Valetta; but in the country around, and in Gozo in particular, the atmosphere is from 2° to 4° cooler. The most prevalent winds are the south-east (the Sirocco), and the north-west; the former characterized by its humidity, accompanied by an exhausting degree of temperature, producing a damp and suffocating smell to the sick: these Siroccos are most prevalent in August, September, and October. The north-east wind ("gregale") is brief and violent in its duration, frequently occasioning serious mischief in the harbour during the winter months. Occasionally sudden and partial gusts of intensely heated air are felt in Malta, which are blown from the coast of Africa. Fortunately they seldom exceed half a minute in duration, for if longer continued life would be extinguished, owing to the severity of the heat, which is remarkable for blowing in tracts, affecting the inhabitants of one house and not their neighbours. It is probably a portion of the "Samiel" or "Simoom" of Africa. When dry wind blows over the island, especially in summer, volumes of impalpable dust float about, which is precipitated in the shape of a shower of mud, on the recurrence of a damp wind, or when the fogs and dews are peculiarly long. Snow only appears at Malta as a luxury imported from Etna, but in the winter months there are frequent hail showers. Rain falls with tropical violence in December, January, and part of February. About March the sky gets settled; an occasional shower may fall in April and May, but during June, July, and August, not a cloud is to be seen. September and October are cooled with showers, the air is placid and invigorating, and termed "St Martin's," or the "little summer."

Agriculture.—The island of Malta contains about 50,000 acres of cultivated land. The island of Gozo, 10,000. About half is private property, the remainder may be nearly divided between the crown and the church. The leases are from one to eight years, and long leases from nine to a hundred years. The rent for the best land is £3 per acre, but there is not much of that quality; the average rental is £1 an acre. Property on short lease cannot be sub-let without the consent of the proprietor. In long leases sub-letting is allowed. The repairs fall upon the proprietor in the short leases, and upon the tenant in the long ones. In all arable lands it is prohibited to sow wheat and barley two years in succession. The principal objects of agriculture are cotton, grain, and sulla; and it is to these that the farmers principally direct their attention; they, however, extensively cultivate beans, peas, a species of wild pea called cucciarda, carrots, melons, potatoes, cabbages, cauliflowers, and other articles of that description; these are principally cultivated as intermediate crops between cotton and corn. In general the farmers divide their lands in two equal portions; on the one half they cultivate cotton, and on the other grain.

Cumin seeds and aniseeds are successfully cultivated, and exported in considerable quantity to the surrounding countries in the Mediterranean, as well as to England and America; and the cumin seeds of Malta are as good as any, if not the best, in the world. The squills grown and dried in Malta are found to produce the best oxamel attainable from that bulb; and the quantity of oranges hitherto furnished by Malta to the tables of the luxurious in France and England, might be greatly increased. Indeed, the oranges of Malta are confessedly the finest of the Mediterranean, and its melons are superior to the best of the southern countries of Europe. There are a variety of other delicate fruits. Vegetation of aromatic plants and herbs of every sort, aided by rich pastures refreshed by the regular falling of nocturnal dews, enable the natives to rear considerable herds of cattle and flocks of sheep and goats, whose flesh, aromatized by excellent food, possesses an exquisite flavour. Poultry are plentiful and excellent. Quails, and a great diversity of other wild-fowl, never fail to come in vast flights at the time of their annual migrations.

Much attention is bestowed on the management of bees: a great many hives are kept in several parts of the island, from which they yearly procure a large stock of deliciously-flavoured honey. Great pains are also bestowed on the breeds of asses and mules, and the qualities of these useful animals have been highly improved by the inhabitants. The asses, especially, are well known for their unparalleled strength and beauty; they always sell at a high price. The goats are of a very fine breed, but the horned cattle are small, and principally imported from Sicily, Barbary, and the adjacent coasts. Snakes are to be found, but they are not poisonous. Birds of various kinds migrate to the island at different periods, and the hawks of Malta were formerly much celebrated; the bees were also renowned, and indeed continue to yield such excellent aromatic honey, that it is conjectured the island was thence called "Melita" by the Greeks. Mosquitoes and other insects abound.

Population of Malta and Gozo in 1834.

	Ma.	Fe.	Totals.		Pop. to the Sq. Mile.
			Males.	Fem.	
MALTA.					
Natives, . . .	47321	51606	52407	53153	$1111\frac{14}{95}$
British Residents,	553	480			
Foreigners, . .	1899	491			
King's Troops,*	2323	-			
Wives of Do.,	-	262			
Children of Do.,	245	258			
Persons connected with the Troops, not Soldiers, .	37	32			
Children of Do.,	29	23			
Gozo.					
Natives, . . .	7837	8515	7845	8522	$606\frac{5}{27}$
British Residents,	8	7			
			60257	61674	
			121926		

The Maltese are generally of middle stature, with robust frames, and small hands and feet; the hair black, and sometimes inclined to frizzle; lips frequently thick, and skin swarthy among the common people where exposed to the atmosphere; the eye dark and bright, and among the higher classes of females, remarkable for that fullness and languishing beauty which constitutes the great charm of oriental women. In some of the villages, such as the Casal of Zurrico, there are a remarkable number of blue-eyed persons to be met with. In general there is throughout the villages a good deal of the Spanish character displayed, but in the cities, and among the higher orders, a sort of French and Greek character is combined. The men are industrious, active, frugal; attached to their country, passive, but yet nowise deficient in courage, as they have often shown, and they are considered the best seamen in the Mediterranean. Those in easy circumstances dress like other Europeans, but the lower orders are clothed in a loose cotton shirt, over which is a wide vest, or jacket, with silver, sometimes golden buttons, a long twisted scarf, wound several times round the body, with very often a sheathed knife placed therein; loose trowsers, leaving the legs bare from nearly the knees downwards, and very peculiar shoes called *korch*, which is a leathern sole, fastened with strings, or thongs, to the foot and leg, nearly like the old Roman sandal. The head in winter is covered with a woollen cap of different colours, having a hood attached, and falling down on the back; in summer, large straw hats are worn. The women are attached to their primitive dress, consisting of a short cotton shift, a petticoat (generally of a blue colour), an upper robe opening at the side, and a corset with sleeves. The hair, covered with pomatum and powder is arranged in a high cone in front of the head, and the face is concealed by a large black silken veil called *faldetta*, which the wearer adroitly shifts when exposing her features to a side or full view. Many ladies of the upper class have recently adopted the English costume, except during the time of performing their religious duties, when they appear at church in their ancient costume.

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* Exclusive of the Malta Fencible Regiment, the men of which are returned with the native population.

The upper class speak Italian; the language of the common people is a patois compounded of Arabic, German, Italian, and other languages. The Arabic, however, so far predominates, that the peasants of Malta and Barbary can without much difficulty understand each other.

Religion.—A scrupulous attention to the rites of their church is characteristic of the Maltese, whose established faith is that of Rome. The landed property belonging to the church is considerable; and there are about 1000 secular and regular clergy in the two islands.

Malta is at present ruled by a military governor, appointed by the crown, and a council, the constitution of which is seven members, four of which must hold offices within the island, namely, the senior officer in command for the time being (not in the administration of the government); the chief justice; the archbishop; and the chief secretary to government. The three unofficial members of the council are to be selected by the governor; two from out of the chief landed proprietors and merchants, being his majesty's native (Maltese) born subjects; and the third from among the principal merchants of the island, being a British born subject, and who shall have actually resided in the island for a period of not less than two years. The island is protected by a naval squadron, Malta being the head quarters of our Mediterranean fleet; and by a garrison of British troops, and a regiment of Maltese fencibles,—consisting of twenty-five officers, forty-one non-commissioned ditto, and 468 rank and file, which the Maltese themselves pay for

MALTHUS, Thomas Robert, whose speculations on the question of population form so prominent a feature in modern political economy, was born on the 14th of February, 1766, at the Rookery, near Dorking, then the property and residence of his father. Having received his earlier education under the care of the Rev. Mr Graves of Claverton, he went to Jesus college, Cambridge, where he obtained a fellowship, and graduated B.A. 1788, as ninth Wrangler; M.A. 1791. In 1798 he published his "Essay on Population, with Remarks on the Speculations of Godwin and Condorcet," being the precursor, rather than the first edition, of his great work on Population. In 1804 he was appointed to the chair of History and Political Economy in the East India Company's college in Herefordshire; a situation which he filled during the remainder of life. He was a fellow of the royal society; and some years before his death was enrolled as a member of the National Institute of France; a distinction conferred generally only on men of the greatest eminence. Mr Malthus was a clergyman of the church of England, and during the greater part of his life read prayers and preached regularly in turn with the other professors, in the chapel of the East India college at Haileybury; in these services, and, indeed, in every other ordinance of religion, his manner was uniformly serious and devout: his sermons were calculated to make a strong impression on the minds of the young men who felt and acknowledged their value; and they became more earnest and more edifying every year he lived. In religion, indeed, as well as in other things, he was always unobtrusive and unostentatious. In person, he was tall, and elegantly formed; and his appearance, no less than his conduct, was that of a perfect gentleman. His death took place at the house of his father-in-law, at Bath; on the 29th of December, 1834; and he was buried in the Abbey church. He left a widow, the daughter of John Eckersall, Esq., of St Catharine's, near Bath; a son, the Rev. Henry Malthus, and a daughter. For an account of his peculiar tenets, see *Political Economy.*

MALVERN. There are two parishes of this name in the county of Worcester, distinguished as Great Malvern, and Little Malvern. Population of Great Malvern in 1841, 2911; of Little Malvern, 103.

Great Malvern is a place of considerable resort in consequence of its antiquities, natural beauties, and salubrity, but more particularly for its medicinal springs, called St Ann's and the Holy Wells. The village contains several hotels and lodging-houses for visitors. The church of Great Malvern is a very ancient Gothic structure, of the cathedral description; it is 171 feet in length and sixty-three in breadth. It has a fine tower with battlements and pinnacles, rising from the centre of the building, 124 feet in height, containing six bells, a clock, and chimes. This church formerly belonged to, and formed part of the famous monastery which long existed here, and held the rank of one of the most magnificent, rich, and influential religious institutions of the kingdom. It was founded for secular canons, previously to the conquest, and endowed by Edward the confessor; the only part of this once extensive edifice now remaining is the gateway, which is in a state of excellent preservation. At the general dissolution of monasteries in the reign of Henry VIII. the inhabitants bought the church, and made it parochial.

The *Malvern Hills* adjoining this village, and extending into Herefordshire, are of very large dimensions, stretching along for nine miles in length, and varying from one to two in breadth. The highest parts are those called the Worcestershire and Herefordshire Brecons; the former is 1300, and the latter 1260 feet above the level of the plain. These hills are approachable with the greatest ease imaginable, even by invalids, so gentle in some parts is the acclivity; they present views of the finest description over Wales and the counties of Hereford, Gloucester, and Worcester. They have the appearance of vast rocks, and are composed of limestone towards the west, and a species of quartz towards the east.

MANSFIELD; a town in the county of Nottingham, on the border of Sherwood forest; distant from Nottingham 12 miles N. by W.; from London 128 miles N.N.E. It was anciently a British, and afterwards a Roman station, and flourished during the Saxon heptarchy, being a favourite occasional residence of the Mercian kings. In the time of Edward the confessor it was a royal demesne, and continued so until William Rufus gave it to the cathedral of St Mary, at Lincoln. When Sherwood Forest was a royal chase, the kings of England had a hunting seat here. The town is neat and well built, and has latterly been considerably improved. It has some extensive cotton-mills, besides manufactories of hosiery and lace. A railway, seven miles in length, connects it with the Cromford canal. Population of parish in 1841, 9788

MARBLING PAPER. The art of marbling paper was originally introduced into England from Germany. In 1810 it made its appearance in Glasgow, and was carried on to a considerable extent by Mr Hugh Sinclair, and subsequently by Mr Alexander Inglis. Since then, Mr John Ferguson (to whom we are indebted for the materiel of the present article) has bestowed much time and labour in perfecting the art. He has produced with much success those fine patterns of marble paper known under the names of Spanish, Dutch, and Nonpariel marbling. The following will give an idea of the principles on which the process of marbling is conducted. A trough is provided nine feet square and four inches deep, into which is put a solution of gum. The colours are ground down to the consistency of cream, and mixed with gall and turpentine. These are then taken up with a large brush and shaken over the solution in the trough. The paper is then lifted by the two corners and laid gently down on the type of the colours; after which it is removed on rods and hung up on a frame twenty feet in length by nine feet in width. When dry, the paper is glazed by a calender, and sent into the market. The different patterns are formed by laying down the colours in stripes, or in figures like shells, and drawing them to the particular pattern desired, whilst they are floating on the surface of the gum. Book edges are marbled in the same way as a sheet of paper; the operation, however, requires to be performed with care, lest the colours should make way between the leaves and deface the book. The ends are first marbled and then the fore-edge. The colours for marbling require to be of a very fine description. Formerly, indeed, the artizans in this line were very careful of expense, and deemed rose-pink with a little vermilion a costly material. Mr Ferguson furnishes us with a list of colours, the bare mention of which would have astounded his predecessors in the art—*Reds:* Deep scarlet Lake, Carmine, &c. *Blues:* Prussian, Antwerp, Verditer, and Cobalt. *Greens:* French, Brunswick, Emerald, and Mineral. *Yellows:* Lake and Crome. Besides these, a great variety of intermediate shades are used; and the marbler now requires a knowledge of design, and considerable skill in the combination of colours, to produce the effective and highly ornamental patterns exhibited in our costly bound books.

MARIA LOUISA, (*a.* to articles *Bonaparte* and *Parma.*) Maria Louisa Leopoldine Caroline, archduchess of Austria, and wife of Napoleon, was the eldest daughter of the emperor Francis I., and of the second of his four wives, Maria Theresa of Naples, and was born at Schönbrun, in 1791. She was bred like other daughters of monarchs. She was taught to speak French and Italian, and to play on the piano, with all the other appendages of drawing, dancing, and riding. Born at the very dawn of those tempestuous events, in which Austria was so long and so disastrously engaged, and in which, by a succession of disgraceful campaigns, her father lost, one after another, the best provinces that a succession of marriages had added one after another to the possession of his ancestors, Maria Louisa had learned from her nurse never to think of the French without shuddering with horror, never to finish her prayers till she had added a curse upon the name of Napoleon. But fortune favoured the brave. Austria fell before Napoleon, and could only propitiate the conqueror by bestowing on his hand Maria Louisa. The mild creature never knew how to show any repugnance to other people's desires. She had been taught to hate, and she hated; she was now bidden to love, and she married. On the 11th of March, 1810, the nuptials were celebrated at Vienna, Berthier prince of Neufchatel representing the person of Napoleon. Two days afterward the bride proceeded towards France.

In a little village near Soissons, a single horseman, in plain dress, rode by her carriage, and approached as if to reconnoitre more closely. The carriage stopped, the door was opened, the cavalier entered, and they proceeded together. Thus did Napoleon, by an unceremonious surprise, introduce himself to his bride; thus was her love romance commenced and finished. During the three following days, she was led through all the ceremonies of the French court, and, March 31st, she received the nuptial benediction from cardinal Fesch, uncle of Napoleon.

Maria Louisa was then in the flower of her age. Her stature was above the middle size; her complexion fresh and blooming; she had auburn hair, Austrian eyes and lips; her hand and foot served as a model for the *Concord*, a statue of Canova. Her temper was sweet and gentle. An obedient and dutiful wife, she won the affection of her warrior, by all the charms of youth and innocence. Her modest and artless deference could not fail to conciliate his despotic and wilful temper, and her unaffected tenderness was repaid with kindness and regard. Her intellectual faculties, it is true, were far from equalling those of her unfortunate rival Josephine, who exerted a useful influence upon the mind of her consort. Maria Louisa could do little more than bless and smile. Napoleon loved her the better for it. His ideas of the sex he had expressed to Madame de Stael, when that ambitious lady asked him who was the woman he liked best in the world. "*Celle que fait plus d'enfants,*"* replied the destroyer.

A year had scarcely elapsed, when Maria Louisa made him father of a son. Never was a child more noisily greeted at his coming into the world, nor could ever a woman be prouder of her offspring, than was the fortunate mother of the king of Rome. All Europe was awakened by the thunders announcing her happy *accouchement.* High mass was celebrated at all altars. Monarchs and princes came to attend the baptismal solemnity. Napoleon felt as if the revolving wheel of fortune had by that event been stopped for ever. Alas for him, that event was the last of unmingled prosperity. His impious war of Spain raised against him the execration of the just; the imprisonment of the pope excited against him the zeal of the pious; his campaign of Russia armed heaven and earth against him.

His hour had come. The divinity, that had determined his destruction, maddened him first, and made his bewildering greatness the instrument of his fall. While starting for his last campaign of Germany in 1813, with the vain hope of conciliating his father-in-law, he placed his dutiful wife at the head of the regency which was to govern in his absence. His ingenuous empress, his mild and inexperienced companion, whom he had always called *ma petite oie*, "my little goose," was raised at once to the government of a tottering empire, in the midst of intrigues and factions, in days of perils and storms. Her task, however, was not so difficult as might be supposed. She received, by the mail from her husband, the speeches she was occasionally to deliver before the senate; by her side was constantly sitting Cambacéres, the archchancellor, the right eye of Napoleon in all political transactions; and the *yea* and the *nay*, by which the regent answered all questions, were always dictated by the nod of the minister.[*] The destinies continued adverse; the French territory was invaded; the flood threatened from every part. While Napoleon by marvellous efforts checked the allies on the right, they prevailed on the left, and arrived under the walls of the capital. Maria Louisa, who had nothing to fear from the besiegers, among whom were her father and brothers, without waiting for the result, insisted on being sent to Blois; and thither she was accordingly escorted by twenty-five hundred men, the very soul of the garrison of Paris. Three days after, the capital surrendered; and eleven days later the emperor abdicated his crown at Fontainbleau.

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* She who gets most children.

Maria Louisa, willing or unwilling, always without a will of her own, was obliged to follow her father to Vienna. In his exile, in his mock empire of Elba, Napoleon received visits from his mother and sisters. Friends and servants appeared by stealth, in haste, with a tear of regret, or with a ray of hope for better days. Towards the August of 1814, another visitor came; a fair lady with a fair child in her arms, sailing from the neighbouring shores of Italy, with an air of great precaution and mystery. Napoleon received her with great attention, covered the child with his kisses, and clasped the mother to his bosom. There she remained two days and two nights, jealously hidden from public curiosity. Then, with the same secrecy, preparations were made for her departure. Napoleon accompanied her to her barge, and stood upon the shore, long eagerly gazing upon the fading sail. Whence that lady had come, whither she was going, who she was, could not then be told. It became, however, afterwards, but too certain, that the lady was not, as history would fain have recorded, Maria Louisa, nor the child, the king of Rome.[†]

From the Isle of Elba, Napoleon started for new fortunes. His eagle once more spread its wings over France; his standard once more waved on the battle-field. One of the first cares of his re-established empire, was to assert his sacred rights over his wife and child. But Austria no longer dreaded his power.. Austria was now at the head of his enemies; and Maria Louisa, under the paternal protection, and a prisoner in the Austrian court, was learning to forget her husband, and embroidering the banners which were to confront his eagle. An attempt was made, by the friends of Bonaparte at Vienna, to carry off his empress and heir, whom Napoleon had promised to present to the people at the *Champ de Mars*. But the plot was discovered, and Maria Louisa remained at Vienna till after the battle of Waterloo.

A fugitive, a prisoner, a victim chained, Prometheus-like, for torture, to the rock of St Helena, Napoleon seemed never to think of his wife but with the fondest affection. His empress and child were the object of a profound anxiety. His letters and messages to her were reiterated with vain but incessant assiduity. The first question he addressed to all visiters, was about her. To her he gave his last thoughts, his last words. To her, in his last will, he intrusted all he still fancied himself to possess. To her love and kindness he recommended all such friends as had any claims upon his gratitude; his veterans, the companions of his glories, the sharers of his disasters. Whatever might have been his opinion of his empress during his life, he seems to have died her enthusiastic lover.

At the epoch of the treaty of Fontainbleau, in 1814, the allies, having to dispose of the empress, thought of indemnifying her for the loss of her august titles, by giving her a share in the spoils of Italy; that unfortunate Italy, which, in all political transactions, has always been dismembered and parcelled to balance accounts. It was resolved, that she should be duchess of Parma, Placentia, and Guastalla, and her state was to be transmitted to her son as legitimate heir. The attempts of Murat, king of Naples, to make himself master of Italy, the troubles of the whole peninsula, and subsequently the return of Napoleon from the isle of Elba, prevented the princess from being sent to her states. After the battle of Waterloo, Bonaparte's son was rebaptized; instead of his paternal name Napoleon, he was called Charles Joseph; his title of King of Rome was changed into that of duke of Reichstadt; he lost all right to his mother's succession, and was withdrawn from her guardianship.

Maria Louisa had no spirit and no capacity for resistance. They bade her put off the arms and liveries of her husband; to divest herself of the title of empress; to forget Napoleon; to surrender his son. In all she was obedient. Widowed and childless, but surrounded with pomp and magnificence, all things being settled and disposed for her reception, she left Vienna and hastened towards her humble metropolis. Greeted and applauded wherever she passed in her journey, she drew after her the best part of the population of Lombardy. Parma was crowded with strangers of all nations and conditions. They were especially the friends and servants of her husband, French and Italian warriors of the Russian and German campaigns; disappointed people, who looked to her as the centre of their discomfited party, and to her son as the *spes ultima mundi*.

The show and triumph displayed on the occasion, the enthusiasm excited by her appearance, were unexampled in the annals of Parma. The first intoxication of the Napoleonists, however, considerably abated, when they heard that her son was not with her. The disappointment was still greater, when the new government, thanking them for their good wishes, desired all strangers to return to their homes. The festivals were soon over; the capital was restored to order; and Maria Louisa was left alone with her subjects.

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[*] We find among the memoirs of that epoch a little anecdote so universally asserted, as to leave small doubt of its authenticity. Napoleon, who was not always careful in the choice of his expressions, in a fit of impatience against some show of a reluctant spirit on the part of his Senate, walking up and down in a passion, and stamping upon the floor had exclaimed, "*Ces sont des ganaches*," "They are blockheads." Maria Louisa, who was not much beyond the elements in her French, timidly approaching him, asked for the meaning of the word, *ganache*. Napoleon answered with visible embarrassment, "Why,—it means,—clever fellows." Maria Louisa treasured up the word. During her regency, being pressed to answer some difficult question, "Let us consult the archchancellor," said she, "*qui est le plus grand ganache de tous*," (who is the greatest blockhead of all.)

[†] It was afterwards understood, that she was a Polish countess from Warsaw, the heroine of one of the few love intrigues in which Napoleon ever indulged.

The *duchy of Parma and Placentia*, one of the most fertile portions of the lovely vale of the Po, bounded on the north by that noble river, on the south by the ridge of the Apennines, on the east by the Enza, and on the west by the Trebbia, two tributaries of the Po, measures about 2200 square miles, and has now nearly 500,000 inhabitants. Parma and Placentia, formerly two noble republics, proud of the monuments of valour registered in the annals of their days of liberty, in 1508 were added to the territory of the church by the warlike Julius II. They were subsequently erected into an independent duchy by Paul III., who invested with them his son Pier Luigi Farnese; and remained as a possession of that family until its extinction in 1748. Then, after long wars which cost Europe more blood than the states were worth, they were adjudged to the Infant Don Philip, of the Spanish house of Bourbon. Ferdinand, heir of Don Philip, found himself involved in the catastrophe of the French invasion; and in 1802, Parma and Placentia were united to the French republic and empire, under the appellation of the department of the Taro.

Maria Louisa, enthroned in prejudice of the legitimate heir, found at her arrival a flourishing state, enriched by the gold lavished upon it during the Spanish dominion, by the comparative peace it enjoyed during the first storms of the French revolution, and by the commerce and industry awakened by the active government of the lieutenants of Napoleon. Parma, its capital, a pleasant and lively town, with a population fluctuating between thirty and forty thousand souls, lies on a smiling plain upon the banks of a small river from which it derives its name. Its frank and hospitable inhabitants have always rivalled the largest capitals in every department of intellectual culture. Under their last Spanish duke, Don Ferdinand, enjoying the blessings of an uninterrupted peace, the university of Parma had been ranked among the most celebrated of Europe. While the prince, a weak and bigoted spirit, amused himself with singing litanies and ringing bells with the monks, the people cultivated letters and arts, and Parma was honoured with the flattering appellation of the Athens of Italy.*

It was then difficult to misunderstand the course to be taken by the newly installed government. Days of repose having finally returned, the happy and liberalizing pursuits of peace were now to be resumed. Maria Louisa was perhaps by taste and inclination addicted to all kinds of refinement, and naturally inclined to declare herself a patroness of learning and art. But, had it been otherwise, the genius of the place would have prevailed over her. A taste for such accomplishments is communicated to all the foreign rulers of Italy at their first arrival. They seem to breathe it with the air of that delicious country; with the very perfume of the flowers of its fields. The university prostrated since the days of military despotism, the academy of the fine arts ransacked by the commissaries of the French government, were by the new sovereign restored in part from the ravages of the recent convulsions. Her comparatively mild government brought many conspicuous personages from the neighbouring states, and her munificent encouragement soon called all talents into exercise.

Turning her attention to more durable monuments, she laid the first stone of a magnificent bridge on the Taro, one of the mightiest of torrents; a gigantic work, which cost her seven years of care and several millions of francs; a colossal structure of stone, with twenty arches, nearly half a mile in length, wide enough to give passage to four carriages abreast, without contradiction the noblest bridge in Italy, and perhaps in all Europe. This bridge being achieved, she set at liberty some twenty inmates of an ancient female convent, pulled down their cells, and raised upon those ruins a golden theatre, a splendid temple to the arts, rivalling in magnificence the Scala in Milan, and the San Carlo in Naples. She bestowed upon it large sums under the title of dowry; she called around her every kind of performers; she was proud of possessing an unequalled orchestra; and, since the Italians give up every thing for music, she afforded to her subjects music to their hearts' content.

Her bridges, however, her theatres, her superb villas, her magnificent train, her regiments of grenadiers whom she dressed and undressed with the capricious fondness of a girl for her dolls, her profuse liberality to stage players and fiddlers, before long exhausted her finances. Commerce and industry languished; taxes pressed hard on the labouring classes, and the state ran merrily in debt. Money went to Austria under a thousand pretexts, and without pretexts. It was now a tribute of vassallage, now a bargain of alliance. Manufactories were closed, as injurious to Austrian industry; steamboats were stopped, as encroaching upon Austrian commerce. Maria Louisa paid her expenses when a guest at the court of her parents; she paid the board of her son, whom they held as a prisoner. Her ignorance and submission to the commands of her father account for the mismanagement of the funds of her subjects; she could, so far, do no better;—but the enormous amount of her civil list, her foolish prodigalities, and above all her restless peregrinations, were not less fatal than the insatiable cupidity of Austria.

No sooner had the swallows of the first spring returned, than she began to feel uneasy within the walls of her palace. It was now the desire of embracing her son at Schonbrunn, now her sister at Munich, now her cousin at Naples. And, wherever she went, there followed a long caravan of dames, pages, and grooms, horses and chaises, dogs, parrots, and monkeys. The monarchs of Europe, made wise by recent events, had adopted an economical style of travelling, in order to enjoy more comfort and freedom, and especially to spare the purse of their subjects. The emperor of Russia was seen travelling in a modest carriage and two, under the name of count of Moscow; the king of Naples appeared in the north of Italy with two attendants, as the count of Aversa; the petty duchess of Parma alone kept up in her journeys all the splendour of the purple. Out of mere kindness, her subjects and allies continued to her the title of majesty; she went through the world in all the pomp of the late empress of France. The newspapers expatiated on her splendid attire and her unbounded liberalities. Her arrival was an event, her progress a triumph. While she was making so much noise abroad, her people were quietly starving at home. Yet she continued honoured and beloved by them. Her conduct was considered as the consequence of the vile policy of Austria. They believed her unacquainted with their miseries. Among the common sufferings, a word of sympathy was always reserved for her. They called her *the poor betrayed, — la povera tradita;* and, at her return, the warmest reception always awaited her.

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* See Botta, Storia d'Italia, Lib. II.

It was not rare, however, that some friend took pains to inform her of the true state of things. More than one appeal was made to her sensibility. There is no free press in that country, but truth knows how to find its way to the throne. One year she was preparing to set out on a voyage to Naples. She had hired a frigate of the king of Sardinia, and furnished it like the barge of Cleopatra. The harvest had been very scanty, the winter very severe. Her people murmured and groaned. On the eve of her departure, at supper, under her napkin a little note was discovered; it was in a few lines the voice of her people. Maria Louisa read and turned pale; she bit her lips, and shed tears of rage; her courtiers were confounded; but on the morrow, the *poor betrayed* was riding to Genoa, and three days after, sailing for Naples.

To these causes of public discontent, other grievances of a more serious character were added, helping to undermine her popularity. As early as the days of her triumphal entry into her states, the general enthusiasm excited in her favour had awakened the jealousy of the cabinet of Vienna. They felt as if the rock of St Helena and the walls of Schonbrunn could not assure them against the charm attached to the name of Napoleon. The family of Bonaparte, scattered, exiled, or closely watched by the police at Rome, appeared to be disarmed for all ambitious attempts. All hopes and wishes were thus turned towards her; and situated, as she was, in the centre of the boldest population of the peninsula, it seemed, that, at the first shout of emancipation, she would be placed at the head of the nation, and proclaimed regent of Italy. Austria saw this, and, with that same indifference with which she had been sacrificed to the interests of her family and given up to her enemy, it was now decided, that she should be prostituted to her courtiers, and undone in the opinion of the nations. Her ruin and infamy, we say, were resolved upon as a *coup d'état;* by which we shall be understood to affirm, that such was the confident belief of her subjects. History shrinks from the responsibility of asserting a political profligacy so atrocious.

To undo a weak and unsuspicious woman, amidst the intoxication of a loose and dissipated life, alone and unadvised, surrounded by snares and intrigues, with a warm and passionate temper, in want of some object of affection, hopelessly separated from all its legitimate objects, was but too easy. A few years had scarcely elapsed, when the report of her misconduct had already degraded her in the eyes of Europe.

Adam Halbert, count of Neipperg, lieutenant-general of Hungarian light-horse, was appointed by the Aulic council private secretary to the duchess of Parma. According to the scandalous chronicles of the times, the secretary and the lady had been long before familiarly acquainted. General Neipperg, it was said, made part of the brilliant train which escorted Maria Louisa, bride of Napoleon, to the fair destinies which awaited her in France. Be this true or not, their mutual situation in Parma could not fail to bring them soon into the closest intimacy. In affairs of state and parties of pleasure, riding, dancing, hunting, and travelling, they were constant companions. The general had orders never to depart from his mistress's side; she had orders never to move a step without him Neipperg was a tall, fine-looking personage. His age at his arrival was not much beyond thirty. He had a bright, warlike countenance, and when seen on his left side, he was a striking type of manly beauty. In his early campaigns, in a close engagement, the lance of a French hussar had deprived him of his right eye. That honourable wound was carefully covered with a black band, and there remained charm enough in the eye he had left to win a weak woman's heart. It was but too soon, and alas! before the 5th of May, 1821,* that Maria Louisa began to prefer her groves of Sala and her parks of Colorno, to the watchful curiosity of the city. It was too soon, that her pale brow had sunk from its habitual expression of Austrian pride; that she was confined to her apartments for long intervals; that, in short, the King of Rome ceased to be without a rival in her maternal tenderness.

The report of her weakness spread. In Milan and Turin the Italians, always bold and independent in the theatre, received her with loud cheers; "Long live the countess of Neipperg." But a countess of Neipperg was living in Austria, and, by the arrangement of the congress of Vienna, Maria Louisa, in case of marriage, was to be bereft of her states. At length, however, the lovers, having found themselves both in a state of widowhood, and the cabinet of Austria having yielded its consent, with great secrecy and haste, in a small chapel at Naples, they received the nuptial benediction; and this

> "Connubium vocat; hoc prætexit nomine culpam."

The epoch of her long connection with general Neipperg was one of the happiest for her subjects. Neipperg was a man of generous and liberal sentiments. Endowed with a mild, though rather an obstinate temper, he abhorred violent measures; and, whenever he did not labour under unfavourable prepossessions, he always stood firmly for the cause of justice and truth. He was very popular. He spoke not only Italian, but even the vulgar dialects of the country; his style of living was simple; his manners affable and easy. In public calamities he was zealous and active for the cause of humanity; in public seditions he appeared alone and unarmed, disarming popular fury by the calmness of his countenance.

The days of Neipperg's administration were over too soon. In 1827, his regiment, his family, his courtiers, and the whole population attended his funeral; his helmet and sword were laid by his side; his war-horse was slain on his tomb. Maria Louisa departed for Vienna. The public voice pronounced that the count Neipperg did not carry all her affections to his grave; that he was not during his lifetime the sole master of her thoughts. We reject such accusations. But the melancholy fact is, that there was in her conduct more than enough to authorize all kinds of idle conjectures. Her good people were highly scandalized. "Daughter of the North," they were ready to say, "is it thus, that you give lessons of continence to the glowing bosoms of the sons of Italy? Is it to set such examples, that Heaven bestowed upon you a sceptre, a succession of illustrious ancestors, the glory of a beautiful name? Is it for such an occupant that we kneel before the throne, and bring the fruit of our toil to its feet; that we address prayers to Heaven for its security?"

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* The day of Napoleon's death.

Such discontents were not always expressed in whispers. The people of Parma have, in the worst of times, been famous for boldness of speech. Maria Louisa could hear their murmurs, and read their lampoons. Unequivocal marks of disrespect met her everywhere. She was indignant at it. She changed her manner towards her subjects; her subjects changed their feelings towards her; and, when the general vicissitudes of the peninsula in 1831 arrayed all the population in war against their governments, Maria Louisa had already become an object of contemptuous dislike.

The public revenues being totally exhausted, the successors of General Neipperg, worthless emissaries of Austria, had recourse to the desperate expedient of paper currency. A tremendous riot of the labouring people forced the government to abandon that measure. Tumults and mutinies sprang up among the students of the university, and several young men of the best families were arrested, and sent to a fortress in the heart of the Appenines. The pride of the highest and the interests of the lowest classes were thus equally wounded, when the national *tricolor* standard appeared on the bridge of the Enza, on the Modenese boundary, five miles east of Parma. The roads to the bridge were covered with people of all ranks, men, women, and children, walking, riding, driving to salute the *rainbow of liberty*. The young women cut up green, red, and white ribands, to make tricolored cockades and scarfs. The young men loaded their guns, and whetted the point of their poniards. Maria Louisa armed her twelve hundred grenadiers, levelled her six cannon, and harangued her troops on the square of her palace. Day and night her dragoons, with drawn swords and lighted torches, ran madly in different directions to clear the streets. There was a dead silence; no movement of the people betokened that they had any thing at stake. But horses cannot run, nor soldiers watch, for ever. After three days of such vigorous patrolling, men and beasts were exhausted and sleepy. Maria Louisa asked a reinforcement of the Austrian garrison at Placentia; the Austrian garrison replied, They had no orders.

The people peeped out at the windows. From the windows they began to shoot the dragoons as they passed; then they sallied out into the streets, and, joining in formidable bands, drove those weary squadrons before them; square after square, and row after row, the ducal troops lost ground, and the scene of the skirmishing was transferred to the doors of the palace. There the two factions stood confronting each other, each in their ranks, each under leaders measuring with their eyes the chances of the day. In that dreadful suspense, the duchess, terrified, all bathed in tears, appeared on her balcony appealing to the generous feelings of the multitude. The sight of her produced a wonderful sensation; the people started in a single mass like a single body, rushed against her guards and artillery, and drove them against the palace walls. Her army was disarmed and dispersed under her eyes; and, without firing a gun, or levelling a bayonet, she found herself at the mercy of her people.

The day being thus won for the liberals, a national guard and a provisional regency were organized. The state prisoners were liberated, and the former rulers proscribed. Maria Louisa was forced to sanction all acts by her name. After two days of feverish anxiety, betaking herself to her natural defence of tears and swoons, she obtained her release. In vain the shrewd policy of the old Carbonari remonstrated against a measure, by which the people would be deprived of an important hostage, placed by providence in their hands in case of a rupture with Austria. The chivalrous hearts of the youth who governed the insurgents were not proof against the aspect of feminine sorrow. A squadron of national guards was drawn up; one of her carriages was brought forward; and, surrounded by armed citizens in a formidable array, with tricoloured banners waving around her, and national songs making the air ring, she was escorted for twelve miles, to the banks of the Po. There she bade farewell to subjects who loved her better, the greater the distance from which they viewed her.

Meanwhile Austria had leisure to come to an arrangement with Louis Philippe. Louis Philippe said; "Let me alone, and I will leave others to take care of themselves." The Austria battalions advanced. The first blood was shed in the territory of Parma. It had Austrian garrisons on all sides. A detachment of national guards had advanced as far as Fiorenzuola, a little town ten miles from Placentia. They were two hundred young students from the colleges, half soldiers, half demagogues, sent to stir up the spirits of the ignorant peasantry. Attacked in their sleep, in the dark, by a whole Hungarian regiment, with horse and artillery, surprised, drowsy, in disorder, they fought for two hours, with severe loss to their enemies. Several of them died the death of the brave. A large number surrendered, and, with a rope round their necks, were led to Placentia, to which place Maria Louisa had received orders to repair with the remains of her court.

The people of Parma were awoke from their happy dream by the news of the breach of the non-intervention. But they were not dismayed. Eight young men set out in disguise with postchaises, went across a portion of disputed territory, and, by a daring *camisado*, laid hands on the person of the bishop of Guastallo, an Austrian prelate, the confessor of Maria Louisa, and one of her favourites; and from the heart of his diocese, from the quiet of his palace, they drove him in triumph to Parma, where he was surrounded with guards, and kept as a hostage. He was compelled to write a letter to the duchess, in which he assured her on the part of the rebels, that the touching of a hair of the head of one of her prisoners, would be the signal for him to ascend the gallows. Maria Louisa, out of kindness to her spiritual director, set her captives at liberty, and his eminence was accordingly dismissed. He took his flight beyond the Alps, not stopping until he saw himself among his friends at home, whence he could never be induced to return.

The provisional governments ruled with wisdom and moderation, but answered very timidly to the enthusiastic confidence of the young. They saw how hopeless any resistance to Austria must prove They made all efforts to persuade the most reso lute, that the days of chivalry were over; and it was now a proof of patriotism to submit, to yield to an unconquerable fortune, and wait for better days.

On the 20th of March, at break of day, a thick, close column of eight hundred Austrian infantry appeared at the eastern, and six thousand at the western gate. The most obstinate champions had been dragged by main force, by their parents and friends, from the gates where they had sworn to fight to the last, and the Austrians entered undisturbed.

Maria Louisa returned to her metropolis, to her silent and sullen metropolis. Shops and windows were shut up; at the theatre some of her courtiers raised the cry, "Long live Maria Louisa;" but the theatre was still as death. She confined herself to her palace, surrounded by Austrians, and proceeded against the rebels. None could be arrested but those who refused to fly. They were dragged before a regular tribunal, and judged according to the laws of the country. They underwent a long inquisition, but no crime could be proved against them. No witness could be found to testify, no judge to pronounce a conviction; the witnesses and judges were Italians. Maria Louisa proclaimed an amnesty, in which she excepted only twenty-one individuals, against whom she entertained a personal antipathy. Rome and Modena proscribed their subjects by thousands.

Meanwhile, schooled by misfortune, the duchess limited the number of her servants, gave up travelling and building, and sold part of her jewels. Private and public chagrins preyed upon her mind. One of her favourite ministers was stabbed in broad daylight in one of the most populous squares. Her Austrians had daily quarrels with her Italians. Earthquake, famine, and cholera, successively ravaged her states. The people murmured, as if she had been guilty of all public calamities. She was called to Vienna, after a short lapse of time, to see her first-born pine slowly, and die in her arms. A few years afterwards, she received the last breath of the emperor, her father. Her health, undermined by the long indulgence of a disorderly life, was now shaken by the repeated strokes of adversity. She had lived too fast; she had soon reached her end. We know but little of the particulars of her death. It took place in 1837. According to the statement of the newspapers in which the event was announced she appeared to have died at peace with heaven, and pardoned by her subjects.

MATLOCK; a village and parish in Derbyshire, with a population in 1841 of 3782. The village is finely situated on the eastern bank of the river Derwent, 144 miles from London, and 42 from Manchester. The church, an ancient building, dedicated to St Giles, is romantically situated on the verge of a rock; living, a rectory; patron, the dean of Lincoln. The inhabitants are chiefly employed in the cotton manufactories and leadmines in the neighbourhood. *Matlock Bath*, about a mile and a half S.S.W. from the village, may be considered as a distinct village of modern date, it having originated since the discovery of the tepid mineral springs here, or rather since the period when they acquired reputation, which was about 1698, soon after which they were enclosed, and buildings were erected near them for the accommodation of visitors. There are three bathing establishments, namely, the Old Bath, the New Bath, and the hotel. Hot, cold, vapour, and shower baths have also been fitted up for public use at the base of the rock, called the Heights of Abraham, and these are termed the Fountain Baths, from an ornamental fountain which has been formed in the garden. Many of the inhabitants are employed in converting the spars or calcareous incrustations found here into ornamental articles.

MAUCHLINE; a town and parish in the county of Ayr and district of Kyle. The parish is about seven and a half miles in length, and from two to four in breadth. Formerly, it was of much greater extent, embracing the whole of what now forms the three parishes of Mauchline, Sorn, and Muirkirk. Before the reformation, the lands of Mauchline belonged to the monks of Melrose, but in 1606, they were granted to Hugh, lord Loudon, and the town of Mauchline was erected into a free burgh of barony. In 1631, the district which now forms the parish of Muirkirk was detached from Mauchline, and in 1636, the district which now forms the parish of Sorn was also detached, and both made separate parishes, thus reducing the parish of Mauchline to less than a fifth of its former magnitude. The soil of Mauchline is in general good, though, except in a few favoured spots, it is more noted for the excellent quality, than the abundance of its agricultural produce; there is only one small patch of moss-ground in the parish, that which still marks the place where, in 1648, was fought the battle of Mauchline-muir. Coal exists in the district, though from the manner in which its strata are broken up by a ridge of hills, its position is somewhat uncertain, and none is wrought at present. Abundance of fine red sandstone is found in the parish, of which most of the houses are built. The land is divided into farms of a moderate size, averaging about 100 acres each. This parish possesses much picturesque beauty. From the top of Mauchline hill, which terminates the long ridge of Kyle, a pleasing prospect may be obtained on both sides; more particularly towards the west may be seen Mauchline village, beautifully situated at the foot of the hill; the ground thence finely sloping towards the Ayr, which, at the bottom of the valley, winds it way through the woods "on to the sea;" the mansions of Ballochmyle, Kingencleugh, and Netherplace, with their surrounding woods, adorn the more immediate prospect, while beyond the Ayr, the scene, enriched with the finest forests, stretches away towards the hills of Carrick and Galloway. The water of Ayr forms the boundary of the parish for several miles, only a small district of it being situated beyond the Ayr, at the influx of the Lugar. The Ayr pursues its course between banks, now of high and precipitous rocks of fantastic forms, now opening up into fine haughs and valleys, and being everywhere clad with wood, which grows to its very margin, and finds root among its time-worn rocks, it presents alternately scenes of romantic grandeur and of beauty. The "braes of Ballochmyle," and the "hermit-fancied coves" of Barskimming, have obtained an enduring place in the immortal verses of the Ayrshire poet; and though his genius had its birth amidst other scenes, yet those in Mauchline, it must be allowed, were a "meet nurse for a poetic child."

Among the antiquities existing in the parish may be mentioned, a portion of the old castle of Kingencleugh, which John Knox is said to have visited, and where he dispensed the sacrament, it being then the residence of Campbell of Kingencleugh, a zealous friend of the Reformation, and of the Reformer. The old walls are carefully preserved by Claud Alexander, Esq. of Ballochmyle, the present proprietor. Another relic of a still more ancient age, and in better preservation, is a square portion of the old monastery of Mauchline, in which there is still a large room with a groin-arched roof in fine preservation. To this tower has been annexed Mauchline castle, where dwelt Gavin Hamilton, Esq., the friend and patron of Burns, which is still the residence of the descendants of that gentleman. The ashes of several of the martyrs of the covenant rest in the church-yard, and in Mauchline green.

The *town* of Mauchline is situated near the northern bank of the river Ayr, sixty-two miles distant from Edinburgh, thirty from Glasgow, and eleven from Ayr. The road from Glasgow to Dumfries, and that from Ayr to Edinburgh, intersect one another in the middle of the village. It was formerly a burgh of barony, but the charter having been lost, its privileges have never been renewed. It derives importance as the centre of a rich agricultural district, and must always continue an object of interest as, *par excellence*, the village of Burns, where he spent his early manhood, where he obtained his wife, and where some of the scenes of his happiest poems are laid. The farm of Mossgiel lies about half a mile to the north of the town. The farm-house has been scarcely altered since it was left by the poet. The old church of Mauchline was built in the twelfth century, and after having been the place of the stated devotions of the parishioners for many generations, and on certain occasions of the religious services of assembled multitudes, was taken down in 1827. The present church, which is a remarkably elegant structure, mostly of the modern Gothic style, was built on its site and opened in 1829. It stands surrounded by the church-yard, near the centre of the town. The road from Kilmarnock to Dumfries passes through the village by a wide Macadamized way, opened in recent times, but already lined on either side with well-built houses, and though the old causewayed and narrow streets through which formerly lay the thoroughfare be honoured by fewer passengers, they, with many of the houses celebrated by Burns, remain in nearly the same state as when visited by the poet.

Besides the usual employments pursued in a country village, there is one manufacture in Mauchline which deserves to be noticed as having been carried to an extraordinary degree of perfection. This is the snuff-box manufacture of W. and A. Smith. It was commenced for the first time in this village, by the present proprietors, with a single workman; it now affords regular employment to between fifty and sixty persons, implying a weekly expenditure of about £50. Here are manufactured not only snuff-boxes, but every article in the fancy cabinet line, ornamented with paintings in a variety of styles, from correct copies of ancient and foreign art, missal-work, and the gorgeous scroll-work of the era of Louis XIV., with the most minute and faithful copies of the works of living artists. The manufacture bears witness, in all parts, to the admirable ingenuity and taste of Mr Andrew Smith, by whom it is conducted. Among other inventions of this gentleman for giving neatness and facility in the execution of the work, may be mentioned an instrument which he calls the Apograph, by which pictures of all kinds may be reduced to suitable dimensions, with the greatest minuteness and accuracy. The best workmen are engaged; they attain a remarkable perfection in the peculiar work in which each is employed, whether painting or manufacture, and form a class of ingenious and intelligent persons. The principal depot of the manufactory is at Birmingham, where Mr W. Smith, the senior partner, resides. This box-work is an object of interest and patronage to the neighbouring nobility and gentry; and work-tables, boxes, &c., have been ordered from this village to the palaces of even foreign monarchs. So favourable was the account which the present marquis of Hastings gave of this manufactory to the late king William IV., that the Messrs Smith were in due form appointed box-makers to his majesty. Population of town and parish of Mauchline in 1821, 2057; in 1831, 2232; in 1841, 2156.

MAVOR, WILLIAM, LL.D., rector of Blandon-with-Woodstock, and vicar of Hurley, Berks, was born on the 1st Aug. 1758, in the parish of New Deer, Aberdeenshire. He left his native country at an early age; and when no more than seventeen he officiated as an assistant in an academy at Burford, in Oxfordshire. He subsequently established himself in a school at Woodstock; and, having been employed to instruct the junior branches of the noble family at Blenheim in writing, he obtained so much favour as to get a title for holy orders in 1781. In 1789 the duke of Marlborough gave him the vicarage of Hurley in Berkshire, which he retained until his death; and in the same year the degree of doctor of laws was conferred upon him by the university of Aberdeen. He was afterwards presented by the duke to the rectory of Stonesfield in Oxfordshire, which he resigned, and in exchange obtained the rectory of Blandon-with-Woodstock. As a magistrate for Oxfordshire his conduct was exemplary and useful; and his brother townsmen evinced their good-will and confidence by nine times electing him to the office of mayor. He died on the 29th Dec., 1837, aged eighty. The following is a list of his publications: The Springs of Parnassus, or Poetic Miscellanies, 1779, 8vo. Universal Stenography, or the Art of Short-hand, 1779, 2nd edition 1785, and several later editions. Poetical Cheltenham Guide, 1781. The Geographical Magazine, published under the name of Martyn, 1781, two vols. 4to. Dictionary of Natural History, under the same name, 1784, 2 vols. folio. Elegy to the memory of Capt. James King, 1785, 4to. Blenheim, a poem, to which is added a Blenheim Guide, 1787, 4to. New Description of Blenheim, 1789, 8vo.; many subsequent editions. Vindiciæ Landavenses, or strictures on the Bishop of Landaff's Charge (Bishop Watson), 1792, 4to. Poems, 1793, 8vo. Christian Politics, a Fast-day Sermon, 1793, 8vo. Appendix to the Eton Latin Grammar, 1796, 12mo. The Youth's Miscellany, or a Father's Gift to his Children, 1797, 12mo.; reprinted in two volumes, 1805. The Duty of Thanksgiving, a Sermon, 1797, 8vo. Historical Account of Voyages and Travels from the time of Columbus to the present period, 1798—1802, 25 vols. The British Tourists, or Traveller's Pocket Companion through England, Wales, Scotland, and Ireland, 1798—1800. A series of Tours, by several authors, in 6 vols. 12mo. The British Nepos, or Lives of Illustrious Britons, 1798, 12mo. Elements of Natural History, for the use of Schools, 1799, 12mo.

Young Gentleman and Lady's Magazine, 1799, 2 vols. 12mo. The Lady and Gentleman's Botanical Pocket-book, 1800, 12mo. A selection of the Lives of Plutarch, abridged for Schools, 1800, 12mo. The Modern Traveller, with Illustrative notes, 1800, 4 vols. 12mo. Classical English Poetry for the use of young persons, 1801, 12mo. edited in conjunction with Mr Pratt. The New Speaker, or English Class Book, 1801, 12mo. The English Spelling-book, 1801. Universal History, Ancient and Modern, 1802, 25 vols. 18mo. The Christian Panoply, a Fast Sermon, 1803, 8vo. The History of Greece, 1804, 2 vols. 12mo. The History of Rome, 1804, 3 vols. 12mo. The History of England, 1804, 2 vols. 12mo. Proverbs, or the Wisdom of All Nations, 1804, 12mo. Holmes's Rhetoric improved, 1806, 12mo. A Circle of the Arts and Sciences, 1808, 12mo. The Eton Latin Grammar, with explanatory notes, 1809. General View of the Agriculture of Berkshire, 1809, 8vo. The Mother's Catechism; or first principles of Knowledge, 1809. Catechism of General Knowledge, 1809. The Catechism of Health, containing rules for the management of children, 1809. Collection of Catechisms, 1810, 2 vols. Abridgement of Bourgoanne's State of Spain, 1812, 12mo. A new edition of Tusser's Points of Husbandry, 1812, 4to. The Fruits of Perseverance, three sermons on public occasions, 1814, 8vo. Many of these works, particularly his spelling-book and others formed for the purpose of education, have from the time of their publication been exceedingly popular and successful. But one of the most pleasing of his publications was a selection from his former writings, with general moral reflections derived from his long experience of the human character, which appeared in 1829, under the title of "Miscellanies, in two parts, 1. Prose, 2. Verse, &c." To this his portrait is prefixed.

MAY, Isle of, a small island on the east coast of Scotland, at the mouth of the Frith of Forth, lying between East Lothian and Fife. It is about a mile in length and three quarters of a mile in breadth, being precipitous towards the west, but gradually declining to the east, and affording good pasture for sheep. Before 1816, a rude species of light, consisting of a chauffer of coal on the summit of a tower, continued to be burned here, as a warning to mariners, but in that year a commodious light house was completed, capable of accommodating the families of two keepers. The beacon resembles a star of the first magnitude, and may be seen at the distance of about seven leagues. It is situated 240 feet above the level of the sea, in lat. 56° 12′ and long. 2° 36′ west from London.

MAYBOLE (originally *Minnibole*); a town and parish in the county of Ayr and district of Carrick. The parish is about twelve miles in length and seven in breadth; it is watered by the rivers Doon and Girvan; the surface is hilly, but fertile. The town is agreeably situated on rising ground, with a southern exposure, distant from Edinburgh eighty-one miles, from Glasgow forty-four, and from Ayr nine. The streets are narrow, but contain a number of fine old mansions, formerly the winter residences of baronial families. One of the finest of these is the mansion-house of the Cassilis family, usually called "the castle." In one of the apartments of this castle was confined for many years the countess of Cassilis, renowned in ballad song as having eloped with the celebrated gipsy Johnny Faa. In the tavern of the "Red Lion" is shown the room where Knox and Kennedy, the abbot of Crossraguel, had a famous public dispute on the merits of the mass. The inhabitants of Maybole are chiefly employed in hand-loom weaving for the Glasgow houses. Population of parish in 1841, 7027. of which one-half were resident in the burgh.

MAYNOOTH, a small town in the county of Kildare, Ireland, distant from Dublin fifteen miles W. by N. The royal college of St Patrick, for the education of persons professing the Roman Catholic religion, was founded here in 1795, conformably to an act of parliament then passed. Before its erection, the Roman Catholic priesthood of Ireland were educated in foreign countries, and it was supposed that this might have a tendency to attach the priests to those powers under whom they were trained. To obviate such a contingency the establishment was formed. It consists of two departments, lay and ecclesiastical. The course of study comprehends humanity, logic, mathematics, divinity, and modern languages. Five years are generally allotted to the attainment of knowledge in these branches of learning, and examinations of the students are held twice in each year. The principal officers are the president, vice-president, dean, bursar, subdean, eleven professors, three lecturers, and a treasurer. The number of students amounts to 330. The ecclesiastical establishment is supported by annual parliamentary grants. The lay college depends upon subscriptions, and was opened in the year 1802. The building is extensive and convenient. It consists of a centre and wings, extending 400 feet in length, and containing a chapel, library, refectory, dormitories, &c. It was erected at an expense of £32,000. Maynooth has also a charter-school for fifty girls. The total population of the town and parish in 1841, was 2129.

MAYO; a maritime county in the province of Connaught, Ireland, lying between 53° 27′ and 54° 19′ N. lat. and between 8° 31′ and 9° 20′ W. long. It extends from east to west seventy-two statute miles, and from north to south fifty-eight. According to Mr Griffith's statement, it consists of 1,355,048 acres, of which 871,984 are cultivated, 425,124 are bog or irreclaimable mountain, and 57,940 are under water. The surface of the county is very diversified. The eastern part contains extensive plains, but the western part is wholly mountainous and covered mostly with bog. The principal mountains are Muilrea in the south, 2733 feet high, and Croagh-patrick, on the southern shore of Clew Bay, 2528 feet high. The only navigable river in the county is the Moy, but it possesses a number of lakes and small streams which abound in fish.

Agriculture is in a less advanced state here than in most other parts of Ireland, but vast herds of cattle are reared upon the extensive mountain pastures, and great quantities of flax and oats are raised: the latter for exportation. Here are extensive plains, called in Irish Turlachs, not having any apparent communication with lakes or rivers. In the winter time they are inundated, but in summer become rich and firm pasturage, the waters rising and retreating through the rocky interstices in the bottoms. The prevailing rocks are granite, gneiss, mica slate, quartz, greywacke, porphyry, ironstone, limestone, green serpentine, of a beautiful variegation, and quarries of black marble and slate. The slate quarries are well situated for exportation, being adjacent to the Killeries harbour.

Besides agriculture, many of the inhabitants are employed in the sea-fisheries. The manufactures are mostly confined to articles for home consumption, such as linens, flannels, woollen stockings, and straw hats. The baronies into which the county is divided, are nine in number, and called Burrishoole, Carra, Clanmorris, Costello, Erris (Half), Gallen, Killmaine, Morisk, and Tyrawly. The principal towns are Newport-Pratt and Westport, two prosperous sea-ports, seated upon Clew Bay; Castlebar, Claremorris, Ballaghadareen, Foxford, Swineford, Shruel, Ballinrobe, and Ballina. The assizes are held at Castlebar, and quarter-sessions at Castlebar, Westport, Ballina, Claremorris, and Ballinrobe. Mayo returns two members to the imperial parliament. In 1837 the constituency consisted of 1350 voters. Population in 1841, 388,887.

MEDICAL PROFESSION. The relation in which this profession stands to society at large, and the estimation in which it is held, are in some respects peculiar to it. As a community, physicians are, more than most classes of men, made the butt of ridicule, and not unfrequently the subjects of sweeping and unsparing censure, while as individuals, no class of men are more honoured and trusted. Ignorance, conceit, or bigoted devotion to visionary theories, indifference to human life, and a sacrilegious disrespect to the dead, are freely and generally charged upon them as a body; but individually, they are as generally esteemed, each in his own particular circle, with peculiar affection and regard. Happily for the profession, every man excepts his own personal physician from the suspicions with which he views the rest of his fraternity, and then, as if to make amends for his injustice to others, tacitly, and perhaps unconsciously, attributes to him the distinguishing excellence of having resisted peculiar temptations, to which most others in his situation have yielded. Now, as a man's character among those to whom he is personally known, is of incomparably more consequence to him than his general standing with the world at large as a member of a particular community, it follows that this general prejudice against physicians in its practical operation, is in some respects rather beneficial than injurious to them individually. It fixes a lower standard of merit, by comparison with which each physician is judged; and consequently, it requires less absolute merit to obtain for him among his acquaintances the reputation of pre-eminent worth. Nor does the general prejudice against the profession take away the disposition to apply to a physician in case of need. It is almost always found, that those who when in health are the loudest and most ready in their censure of physicians, are the most prompt in seeking their assistance in sickness; and if they are sometimes troublesome patients, it is not from an unwillingness to trust themselves to professional skill.

But if the primary effects of this prejudice are in some respects favourable to individual physicians, it does not thence follow, that its influence on the whole is either salutary or unimportant. On the contrary, it is obvious, that whatever diminishes the confidence of the public in the profession, takes something from the respectability and influence, and consequently from the means of usefulness of each member. The evil may be in a great measure counteracted by the predilection for particular physicians, of which we have just spoken, and there may be individuals, who will entirely surmount it by the elevation of their own character; but in an extended view of the whole subject it cannot be doubted, that both the profession and the public must suffer from an unworthy estimation of physicians, whether there be just cause for it in the condition and character of the profession or not.

The principal effects, unfavourable to character, which have been attributed to the influence of the medical profession, may be resolved into the two following, viz., a bigotted attachment to authorized modes of practice, and a peculiar sensitiveness of feeling, or readiness to take offence for slight causes. The former renders physicians unwilling to receive information, or to adopt improvements in practice, however valuable, unless they come through the regular channels of scientific investigation, or established theories; the other disposes them to frequent jealousies and quarrels among themselves. There is, indeed, a third, which charges the profession with a want of scrupulousness in regard to the means of acquiring some kinds of knowledge; but of this we do not propose to speak.

Every one must have observed, how frequently remedies are introduced by men who can make no pretensions to regular professional knowledge, for diseases which often baffle the science and skill of educated physicians. We speak not of the infallible, universal remedies, the panaceas, and the catholicons, which are blazoned forth by deception and falsehood, to impose only on the ignorant and credulous. We refer to the more modest discoveries of the means of curing particular diseases, which have obtained the confidence, sometimes founded upon an experience of their benefits, of intelligent and educated men. The effects which sometimes follow the use of such remedies, are not a little surprising; and occasionally they bring no small share of reproach and ridicule upon the profession and its regular practitioners. The lame man, whom a long attendance of the most skilful surgeons has failed to cure, is made to walk by a few applications from the hands of a blacksmith; and a bookseller, by a single word, can teach the dyspeptic to forget his indigestion, laugh at the doctor, and throw away his physic.

Physicians it is true, give little credit to all these things. They rarely adopt remedies thus irregularly introduced, and still less frequently do they acknowledge their efficacy. This incredulity of the faculty, however, does little to diminish the confidence of the public. It rather gives point to their sarcasms upon the profession. If discoveries are made in the art of curing diseases, which physicians with all their learning have not the sagacity to make, (and we hear little of discoveries of this kind by regular members of the profession,) it argues little for their candour or liberality, that they can perceive no merit in them.

Such is the view which many intelligent and educated men take of the conduct of the medical profession towards irregular practitioners, and their irregular practices. But we cannot readily acquiesce in the correctness or justice of this view. We do not deny, that remedies are often introduced by men who are not physicians, which acquire no small share of popular confidence. Neither will we deny, that such remedies are sometimes signally efficacious. So frequently is this the case, that some remedy of this sort is almost constantly before the public, and those who pay little attention to the matter, are hardly aware that they do not obtain a permanent reputation. Hence, they are ready to believe, that there may be some complaints, which quacks can cure better than physicians. It is worthy of remark, however, that the particular remedy in favour, is never for any considerable length of time the same. At one time it is a cure for consumption, at another for rheumatism, at another for dyspepsia, or it is a panacea, and cures every thing. Each has its day, and passes by and is forgotten; or else like a worn-out fashion, it descends from the higher to the humbler walks of life, to struggle on, by the aid of interested puffs and forged certificates, a little time longer. Whether it be that the cures which give it celebrity result only in temporary relief, or that its failures, or its injurious effects, as well as its cures, at length creep into notice, or that the mystery which attended its introduction being dissipated, it proves to be but an old remedy with new pretensions, we stop not now to inquire. The truth of the remark itself will not be disputed by any who have made themselves at all conversant with the subject. This circumstance alone is enough to show what degree of importance is to be attached to remedies the reputation of which is so evanescent, and to free the physician from any just imputation if he is not in great haste to adopt them before their merits are tested, notwithstanding the high-sounding promises with which they are introduced to notice.

It were easy to explain, how it may happen that a remedy shall acquire for a time a high reputation which it does not possess merit enough to sustain. This circumstance is by no means peculiar to the remedies of irregular practitioners. The whole history of the medical profession is full of analogous instances. The habits of rigorous investigation which prevail at the present day in all the sciences, do not indeed now suffer inefficient medicines to acquire a very general reputation. But there have been times, when medicines have been in very extensive use, which are now universally regarded as nearly or quite inert.

No one but a physician (and it is scarcely possible even for him) can sufficiently appreciate the difficulty of discriminating between the effects of remedies upon a disease, and the spontaneous changes of the disease itself. Most diseases have a natural tendency to disappear, sooner or later, of themselves, if not improperly interfered with; and those which have not this tendency often undergo changes, which are unexpected, and for which no specific cause can be assigned. Hence it happens, that the reputation of curing a disease, or of making a great impression upon it, is ascribed to a medicine simply because its use had preceded one of these spontaneous changes. Often, while a physician is congratulating himself upon a successful prescription, he finds that although his patient is cured, his medicine, from some accident, was not administered.

How, then, it will be asked, are we to judge of the value of remedies, if not by their effects? Certainly from their effects;—but not as they are observed in a solitary case, and in a general manner, in reference only to a final result. There must be a series of observations in which the phenomena are compared in the several cases, and the influence of each remedy observed, upon the particular symptoms, as well as its general effect upon the disease as a whole. And before the evidence can be regarded as complete, these observations must have been repeated by different persons, in order that allowances may be made for the influence of a natural partiality for a newly discovered or favourite remedy.

Few, if any, empirical remedies are ever subjected to a trial like this. The secrecy which is observed in regard to their true character, and which is secured, or aimed at, by oaths and subscriptions in some cases, and by variations in the composition of the medicine, to elude the results of analysis, in others, necessarily prevents a full investigation of their real merits. It is a fair inference, that the authors of these remedies are not unconscious that such an investigation would not enhance their reputation. Undoubtedly they act wisely, in respect to the accomplishment of their purposes, in insisting upon this secrecy, notwithstanding the unfavourable inferences to which it subjects them. The mystery, which attends the concealment, forms no small part of the causes of their success.

In the profession, no such concealments are practised or permitted. The whole profession and the public are considered as fairly entitled to the fruits of the knowledge of all its members; and if valuable observations or discoveries are made by any, they are freely communicated for the general good. Their knowledge is thrown into one common stock, from which each may draw according to the wants of his patients, and his own skill in applying it; but which no one is permitted to appropriate exclusively to himself. The profession does not recognise the right of any individual member to hoard up his discoveries, whether real or pretended, for his own private emolument. Among liberal, educated men, it is not to be supposed that any such attempt will be made. But if any one should act so unworthily, he would be at once excluded from the profession. Hence the reason, that none of the boasted discoveries of universal or specific remedies are made by physicians. The name of some distinguished physician is indeed often attached to them; but it is done without his consent or approbation.

Whenever the composition of a secret medicine has been made known, it has almost always turned out, that it contained no agents, which had not been before known and in use among physicians. Some unimportant modification of their composition, and a general and confident administration of them without regard to the particular character of the disease, constitute its only peculiarity. The same thing is nearly true, in regard to all the external remedies, the different modes of applying friction and fermentations, which have of late become so fashionable. Physicians do not rely upon these so exclusively, as do some empirics, and as they cannot generally go through the mechanical operation themselves, they may not always give the full effect to their application of which it is capable; but there never has been a time, from the age of Hippocrates to the present day, when they have not been regarded as important auxiliaries in the cure of diseases.

In chronic complaints, remedies lose much of their efficacy when the system has become accustomed to their action, so that almost any change, or even leaving off medicine altogether, will many times produce some degree of improvement, which is indeed often only temporary. Practitioners of experience are well aware of this, and regulate their practice accordingly; but we have not unfrequently seen a young physician elated with the expectation of accomplishing a cure where older men have failed, because his first prescriptions have produced such an alleviation of the disease. Many of the cures supposed to be effected by newly-discovered remedies may be accounted for in this manner. While the application is recent, it is extensively spoken of, and reported as an effectual cure; at length the system becomes accustomed to the remedy, and its effects cease. But in the mean time the novelty of the subject has passed away, and the ultimate failure of the remedy is little known. An attentive observer may remark, however, that it is in general the same individuals who are cured, over and over, by the succession of new remedies which are from time to time in vogue.

These different considerations will sufficiently explain why it is, that physicians are habitually incredulous in regard to the wonderful healing powers, so often ascribed to accidental discoveries in medicine. They have so much occasion to know (and this knowledge is but too often taught them by disappointments in their own practice) the difficulty of applying a remedy suited to the peculiar state of the system in each stage of a protracted and complicated disease, with all the advantages that science and experience can afford, that it cannot be supposed, that they will place much confidence in the chance operations of ignorant and presumptuous empirics.[*] It may be, that this incredulity, and the contempt for quacks and quackery, which it involves, is sometimes carried to an extreme. It is not our purpose to defend or apologize for physicians; but to trace out the causes of some of the peculiarities of character which the profession exhibits. We may remark, however, that it demands no great stretch of charity to find some better motive for the repugnance of physicians to countenance uneducated practitioners, and their remedies, than the illiberal selfishness not unfrequently imputed to them.

We wish we might hope to come to a result equally favourable to the character of the Medical Profession, in regard to the other point which we noticed. But it cannot be denied, that physicians exhibit a sensitiveness and jealousy of temper, especially in their intercourse with each other, far greater than is met with among other educated men. However amiable they may be in every other respect, and they have perhaps a full proportion of amiable qualities in general, if we touch them on a point of professional etiquette, we find ourselves treading upon corns. In many places, this *noli me tangere* sensitiveness embitters the happiness of medical men, and not unfrequently impairs their usefulness. The causes of this peculiarity are to be found in the nature of the relation between the physician and his patient. This relation is founded altogether upon the confidence which the patient places in the general character and faithfulness of his physician. The intercourse of the physician with his patient is not a mere cold, business matter, but is connected with some of the strongest and tenderest feelings of the human heart. And if there be something like affection in the feelings of the sick towards their physicians, there is often, by a natural consequence, not a little proneness to jealousy. The excited state of mind, produced by sickness and suffering, while it increases the susceptibility to the attentions and sympathy of the physician, adds also to the sensitiveness of any omission, whether real or apparent, and opens the ear to any unfavourable suggestion, however slight.

All this takes place in seclusion and privacy. If any coldness or distrust have arisen, it is unknown to the physician, until he finds that another is called in his room. Hence he watches with anxiety every thing that looks like an indication of it, and becomes apprehensive of every thing that may tend to produce it; so it is also in the intercourse between physicians themselves. If they were brought into frequent and open contact, whatever jealousies might arise would be exposed and removed. If quarrels sometimes grew out of them, they would neither be rancorous nor lasting. But in the secluded manner in which they, in most instances, necessarily live in regard to each other, the whisperings of jealousy operate secretly for a time, and then, like the smothered fire, burst forth with greater violence.

Having said thus much of those traits in the character of medical men, which are not always the most amiable, it is but justice to the profession, that we should notice, although we must do it briefly, one which is in every point of view creditable to them. Whatever faults or follies may be attributed to them, it is, we believe, universally allowed, that they are distinguished for their beneficence to the poor. This is not merely the character of distinguished individuals in the profession, or of a considerable number, or a majority of individuals; but of the profession as a body; insomuch, that any physician, who should not partake of it, or at least assume it, would lose his reputation and standing. The poor man, however destitute of the means of making compensation, calls for medical aid, with the same confidence that his call will be answered, as the richest man among us. He may go hungry, or ragged, or cold, because he has not the means to purchase food, and clothing, and fuel, or is unwilling to beg them; but if he be sick, he need never lie in want of medical advice. Boerhaave is said to have called the poor his "best patients.' Happy the young physician who can now so regard them!

It may be said, that there is little merit in a benevolence, which is thus rather forced upon the profession by circumstances, than sought by their own choice. This may be in a degree true in regard to individuals; although the habitual performance of benevolent deeds, from whatever motive they may have originally proceeded, can hardly fail eventually to excite some corresponding affections in the temper and disposition of the mind. But in respect to the profession as a whole, no such compulsion has ever been, or ever could be exerted upon it, from any circumstances external to it. The custom of attending the poor gratuitously, has now grown, by long usage, into a sort of common law, which the whole profession combined, if ever so much disposed, could hardly abrogate. But it has grown out of the character of the profession itself, and of that of its members. If, therefore, physicians are bound to take shame to themselves for the jealous disposition towards each other, which the circumstances and habits of their profession have entailed upon them, they may well be allowed as an offset against their mortification, some pride in their cheerful compliance with the benevolent customs which they have inherited with it.

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[*] To use *external* remedies only, the same extent of knowledge is not requisite as to prescribe internal medicines. It is often as difficult to decide when medicines are necessary, as to determine what they shall be. It may be here observed, that, in respect to pecuniary profit, quacks are a positive benefit to regular practitioners; the amount of disease which is removed by their means being much less than the increase occasioned by their mismanagement, and by the neglect of proper remedies caused by them.

In England, the chief reliance for the regulation of the profession, is upon the direct provisions of the laws, enforced by penalties, which, in some instances, are severe. The design of the chartered privileges is to secure the community against the ignorance and impositions of empirics. But in attempting this, they have in effect established a difference of rank and of privileges in the profession itself; and this is not always conformed to the distinctions of scientific and professional merit. The London college of physicians, for example, whose powers and privileges, as granted by charter, are exceedingly ample, have established it as a by-law, which no force either of persuasion or compulsion has been sufficient to induce them to relax, that no physician shall be elected a fellow of the college, who has not taken a doctor's degree at one of the English universities, Oxford or Cambridge. This same college has the power (a power which it has on several occasions shown itself sufficiently disposed to exercise) to punish by fine and imprisonment, any man who shall attempt to practise medicine in London, or within seven miles of it, without a license from its own board of censors. The law, however, compels them to grant the license upon receiving proof of a sufficient education, at whatever school it may have been obtained. The advantages for a medical education at the universities are incomparably less than they are in London and Edinburgh, and in some of the schools on the continent, to which many English students resort. As those who have the greatest portion of enterprise and ambition will resort to those schools which offer the greatest advantages, it follows, that a large proportion of the licentiates in practice, must be men of a higher character and a better education than those who hold the higher title, and enjoy the extended privileges of fellows. Still more inevitably does it follow, that there must be perpetual jealousies and collisions between the two classes of physicians. But this is not all. There is still another class of practitioners more numerous than either of these. By the charter of the college of physicians, as we have said, none but a licentiate of that college is permitted to practise medicine. More than a hundred years ago, the college attempted to enforce the law against an apothecary, who had visited a sick man, and given him medicine, by which he was cured, without charging a fee. The house of lords, on an appeal from the king's bench, decided that this was not practising physic, within the meaning of the charter, and thus opened the door for all apothecaries to follow the example. They were of course not slow to avail themselves of the privilege; and in a short time, a very large proportion of the medical practice passed into their hands, while that of the regular physicians declined to little more than consultation.

The whole history of this change is curious and instructive; and singularly illustrates the effect of relying upon legal protection in disregard to the influence of public opinion. It needs no detailed history of the transaction, to show, that at the time when it took place, there was a demand on the part of the community for a more popular class of practitioners, which the law itself could not resist. Whether it was, that the number of physicians was too small, or what is more probable, that relying upon their legal privileges they demanded more compensation or deference in return for the exercise of their profession, than the public were willing to concede, is of little moment. Nothing but such a necessity as we have supposed could have induced the house of lords, by its decision, and the public by submitting to it, to do away by a mere fiction of law, with the express stipulations of the royal charter, sanctioned as they were by an act of parliament. That it was no better than a fiction, is shown both by the nature of the question, and by the subsequent events. For more than a hundred years, the apothecaries in England have performed the duties, which in other countries are performed by physicians. The apothecary visits the patient, and determines what his case requires; and the only real distinction between him and the physician is, that instead of writing his presciption and sending it to a shop, he supplies the medicine himself, and then, by a degrading subterfuge, evades the law, by charging for medicine only, and obtains compensation for his personal attendance, either by an enormous charge for his medicines, or by a sort of voluntary contribution, which custom has rendered legal. Even this yoke of humiliation is now taken from the necks of the apothecaries. As they have provided for the education of the members of their company, the court in 1830 decided, that it is absurd to regard them as mere mechanists, and that they have the right to demand a fee for the mental labour of prescribing the medicine, as well as for the mechanical labour of preparing it.

What are the precise distinctions in the legal rights of this department of the profession, we do not exactly know. But it will readily appear, that here is a third rank in the profession, entitled to, and aiming at, and not unfrequently obtaining, general confidence and employment, as practitioners of medicine. It is sometimes not a little amusing, to witness the struggle between them and their more privileged and higher-titled brethren. While the physicians uniformly speak of them as an inferior class, they seemed disposed to forget their origin. They have dropped the name of apothecaries, and commonly style themselves *general practitioners*. Although they have thus brought themselves into notice and favour, not only without, but in defiance of, the provisions of charters and statutes, we find them no less than their older brethren, relying upon such provisions, for the defence of the privileges they have obtained. They, too, have now their chartered company; and we find by some of the journals, that the complaint is already made, that druggists are presuming to prescribe in contravention of the rights and privileges of the apothecaries. In twenty years, we shall probably see these same druggists treading in the steps of their predecessors, and exalted by some new legal fiction into acknowledged, if not privileged practitioners. In the ultimate result they, too, may become educated and competent physicians. But in the interim, while the process of transformation is going on, the kingdom is filled with ignorant and unskilful practitioners, and new elements of discord and discussion are introduced into a profession already sufficiently divided.

Let us now suppose, that instead of the immense powers conferred on the college of physicians, by its charter, that body had only received such privileges as are commonly bestowed at the present day on similar corporations, the right to elect its own members, and to regulate their conduct by its by-laws. This we regard as the legitimate, and the only proper means, of combining the influence of individual character and conduct, so as to produce a united effect on public opinion. Had this been the only power of the college of physicians, the first effect must have been to prevent the division between the fellows and licentiates. The fellows would have perceived, that the value of the distinction which they enjoyed as such, could only be maintained by the same professional merit by which it was first acquired; and, consequently, instead of framing their by-laws so as to exclude those whose education and character equally entitle them to the same privileges, they would have taken care so to frame them, that the line of distinction should correspond with that of desert. Had they done otherwise, those who were excluded, no matter by what name they were called, would soon have become the most honourable body.

Another effect of such a limitation of the powers of the college of physicians as we have supposed, would have been to prevent the introduction of the apothecaries into practice as physicians, in 1704. Whatever was the cause of the necessity for additional practitioners of medicine, whether it arose from a deficiency in their number, or the want of a different class, with lower attainments and lower fees, the college of physicians might easily have prevented or removed it, by diminishing the obstacles to obtaining a license. No one can doubt that they would have done this, if instead of relying upon the arbitrary privileges vested in them by the charter, they had felt that their power was derived from the confidence of the public. By this means, the apothecaries would still have been excluded from practising a profession for which they were not educated. At the same time they would have suffered no hardship, because although *as apothecaries* they might not practise physic, yet the individuals among them who were in any good degree qualified, would have been admitted to practise, *as physicians*. The necessity for a greater number, or a different class of practitioners, would have been provided for, without the enormous evil of introducing a great body of unqualified practitioners of medicine; and without the additional evil, which it is more particularly our present object to notice, of entailing perpetual discord and contention upon the profession. That such has been the result of the present institution in England, is sufficiently apparent from what we have already said; and to such an extent have these contentions proceeded, that it is not easy to see how society can much longer endure them, or what remedy can be devised for them.

MERIONETHSHIRE; a small county of North Wales, bounded on the north by Carnarvonshire and Denbighshire, on the east by Denbighshire and Montgomeryshire, on the south by Cardiganshire, and on the west by the Irish channel. Its length is about thirty-six, and its breadth thirty-four miles. Its area is estimated at 666 square miles.

This county is a portion of the Alpine district which, commencing in Carnarvonshire, and traversing South Wales, dips under the coal strata, on the borders of the Bristol channel. The surface is rocky and unequal, the valleys afford some fertile fields, and the vicinity of the sea is also found sheltered and productive, but the major part of the county is sterile and irreclaimable. Many of the mountains of this district, as Arrenig, Moelwyn, Rhinog, &c. exceed 2000 feet in height, while Arran, Mowddwy, the loftiest, is elevated 2955 feet above sea-level; and Cader Idris reaches 2914 feet. The scenery of the glens in this county is singularly beautiful, and is enlivened by many romantic cataracts. The principal rivers are the Dee, the Maw, the Dovy, the Gleslyn, and Dwyrid. The agriculture of the county is in a very imperfect state; the principal pursuit of the farmers being that of breeding and rearing cattle. Flocks of sheep and herds of small black cattle are pastured on the hills, and some store cattle sold to the English drovers. The genuine Welch poney is to be found here in all its primitive symmetry, although the breed is nearly extinct in other parts of the principality. The geological structure of the mountainous district consists of grey-wache, flinty slate, and roofing slate, intersected by veins of quartz containing copper pyntes. The vales contain schistose clay, and sometimes peat, constituting bogs and turbanies. The hundreds into which the county is divided are denominated Ardudwy, Eidernion, Estimaner, Penllynn, Tal-y-bount, and Mowddwy; and in these are contained the following towns, Bala and Dolgelly, in which the sessions are held alternately. Corwen, an improving little place, upon the great parliamentary road; Harlech, anciently a borough and the capital of the county; Towyn, Dinasmowddwy, and Aberdyfi. The great staple of this county is slate; these are raised near Festiniog at the quarries of Diffwys, Rhiw-briwdû, lord Newborough, and Mr Holland's works. The slates are conveyed by waggons to the waterside, a distance of seven miles, where lighters receive and convey them to the vessels lying at the port. About 500 persons obtain constant employment in these four quarries. Manufactures of wool are also established in this county, and coarse cloths, kerseymeres, druggets, flannels, and stockings are made in various places. Population of the county in 1821, 34,382; in 1831, 35,315. in 1841, 39,332.

MERTHYR TYDVIL; a thriving town in Glamorganshire, South Wales, 171 miles from London. Not many years since it was an insignificant little village, but the discovery of iron in its vicinity raised it rapidly to importance. The town stands upon the river Taff, in a country naturally sterile and cheerless; it does not possess any degree of regularity of plan, nor can it boast of any public buildings claiming attention for their architectural graces. Here is, however, a spacious parish church, a chapel of ease, several meeting-houses of Dissenters, and a theatre. The cast and forged iron made in this place amount to many hundred tons weekly. The number of hands employed in each of the principal iron-works exceeds 1000, but the whole population of the parish may be said to subsist by means of the iron manufacture solely. The iron, when wrought into bars, is transported to Pennarth, the port of Cardiff, by the Glamorganshire canal and the adjacent railroad, and then shipped for the English and foreign markets. By the reform act, Merthyr Tydvil obtained the privilege of returning one member to parliament. Population in 1801, 7,705; in 1841, 34,977.

MICROSCOPE. (*a*.) In the article on this subject already given in the body of the present Encyclopædia, the invention, theory, use, and various character of this instrument, are perspicuously though briefly stated in popular terms, suitable to the nature of the work. At the period of its insertion a new era had lately opened in the history and application of the microscope; much had been done and was still doing to improve the instrument, in the way of enlarging its powers and correcting its eccentricities; and great accessions were daily being made to our knowledge of minute animals and formations. These, however, were not sufficient reasons for departing from the general plan of this Encyclopædia, by giving remarkable prominence to the article *Microscope* at that time,—the more especially as it was already obvious that a supplementary volume would be necessary, wherein this and other subjects might receive the degree of attention which their importance should deserve. It has therefore been reserved for the present time, to give a more full and satisfactory detail of the improvements effected on the instrument, (chiefly by the labours of Wollaston, Brewster, Herschel, Pritchard, Goring, Coddington, Cary, &c.,) and of the interesting phenomena which, in consequence of these improvements, have been laid open to our view.

Avoiding as much as possible a repetition of the former article, and an iteration of the particulars comprehended under the heads *Optics*, *Lens*, &c., it is still desirable to bring the first principles of the microscope into close connection with all their subsequent adaptations and combinations, and this we shall do in as few words as possible.

An object is rendered visible by the light reflected from its surface, and the eye perceives it by cones of rays issuing from every point thereof,—the apex of those cones being the points whence they are emitted, and their common base the pupil of the eye. Now, though the eye can to a certain extent contract or dilate the pupil, and otherwise adapt itself to the rays falling upon its surface, it is still found from experience that no rays will be converged on the retina, (see *Retina*) and consequently no distinct image of the point whence they proceed be impressed upon it, unless those rays approach very nearly to parallelism. It must therefore be obvious that there is a certain distance at which an object should be placed from the eye, in order to be seen distinctly, or, in other words, that the sides of the radiant cones may approach very nearly to parallel lines. This requisite distance for distinct vision varies considerably in different persons; some who are exceedingly short-sighted, that is, who have an undue convexity of the eye, require the object to be brought within two inches of the visual organ, whilst others whose eyes have less convexity than is usual, can see most conveniently at the distance of ten inches, or perhaps more. Now, bearing in mind that an object cannot be brought nearer to any eye than a certain point, without creating confusion and indistinctness in the image conveyed to the retina, and also considering that to magnify an object, is only in other words to bring it *within* that distance, it becomes evident that if we obtain means for procuring distinct vision at any point nearer to the eye than the natural focus, we at once enlarge the images of objects in an inverse ratio of the two distances. To estimate in a popular manner the magnifying powers of microscopes, it has always been necessary to assume some standard distance for distinct unaided vision; though, from the circumstance of scarcely any two individuals having precisely the same focus of natural sight, the calculations referred to such standard are less satisfactory than could be wished. The early micrographers adopted six or eight inches as a fair average, and, in the present day, Sir D. Brewster limits distinct vision to five inches, whilst Mr Pritchard extends it to ten inches. Of all these standards, that of eight inches approaches most nearly to the general focus of the human eye; but none of them is free from a multitude of exceptions. Perhaps Mr Pritchard's standard of ten inches is the best, as it offers all the conveniences of decimal notation; but in fixing such a focus for the natural eye, it should be premised that, without reference to the actual focus of any eye, the object is to be viewed by it at the distance of ten inches, in order that the ratio on which the magnifying power of the microscope is calculated, may universally hold good. Persons who from short-sightedness *cannot* see an object at ten inches, must determine the magnifying power expressly for themselves. Dr Goring, indeed, advises that the expression of the magnifying power should be discarded altogether, and that we should simply state the focal distance of the magnifier, leaving to every person to determine the correct ratio between it and the focus of his own eye.

The first rudiments of a microscope, and the first efforts at microscopical observation, are to be found in the nursery. A child perforates a card with a pin, and looking upon his book through the small aperture, at a distance of two or three inches, he sees the letters greatly magnified. In this case the aperture becomes the base of the radiant cone, in place of the pupil of the eye, and though the quantity of light is considerably diminished, the parallelism of the two sides of the cone produces distinct vision. This is of course only mentioned in explanation of a principle; for a small vacant aperture merely producing a limited effect by diminishing the light, can answer no useful practical purpose. It is to Refraction, (*qu. vide*) or the bending of the rays of light by the intervention of some transparent medium between the eye and the object,—or to Reflection (*qu. vide*) by means of concave specula, (see *Speculum*) that we must look for a satisfactory magnifying power.

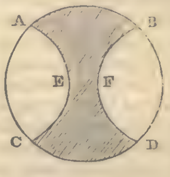
It is found that a circular piece of glass, one or both of whose surfaces are convex, (see *Lens*) refracts or bends the rays of light towards the centre of its convexity; and that if an object be placed in its focus, (which may be determined practically by observing at what distance it will concentrate the solar rays,) the sides of the cones of rays proceeding from all the points in that object are rendered parallel after transmission; consequently an eye on the other side of the lens will perceive the object distinctly at its focal distance, whatever that may be, and will see it magnified in the ratio of the focus of the lens to the natural focus of the eye. Regarded as magnifying powers, concave specula and convex lenses are the counterpart of each other; the reflection of the one producing the same effect in the enlargement of the object, as the refraction of the other.

Microscopes are either *single*, or *double* (or *compound;*) the former consist of a single lens or speculum, the latter of a combination of lenses, or of lenses and specula. They are likewise distinguished into *refracting*, *reflecting*, and *refracting-reflecting* microscopes; in the first case they are formed of lenses, in the second of specula, and in the third of both lenses and specula. We refer the reader to our former article for sufficient notices of these various constructions, as it is not intended in this place to enter into extended descriptions of instruments that have been long in use, and which are consequently well known; our present purpose is to speak of those improvements in the elements of the microscope that have opened up visions of wonder in the world of atoms. See *Catoptrics*, *Dioptrics*, former article *Microscope*, *Optics*, &c.

From the observation of Seneca, (see former article) we find that the ancients had some notion of microscopic power, and that globes of water of different diameters were the magnifiers in use amongst them. Since the sphere therefore seems to connect itself with the origin of the microscope, it may be an orderly inquiry to trace the varieties of the spherical figure that came successively into use, and to state the ingenious expedients by which recent philosophers and men of science have succeeded in improving its performance as a magnifying power.

Spheres.—The discoveries made by the ancients with *their* spheres were few and unimportant, and indeed they could not well have been otherwise; for in addition to the disadvantages resulting from the low refractive power of water, we presume they had no certain means of producing a truly spherical figure, and consequently they would be greatly perplexed by the eccentric refractions of their magnifiers, and the illusive distortions thence resulting. The glass spherule, or minute sphere, obtained considerable reputation in the infancy of the microscope, and indeed maintained it for some time, in consequence of its high magnifying power, and the facility with which it could be formed to almost any degree of minuteness; and as the focal distance of any glass sphere or spherule is distant from its surface, only the one-fourth of its diameter, a spherule of exceedingly small radius naturally appeared to offer the means of enlarging the angle of vision to its greatest possible extent, or, in other words, of reducing the *seeing* distance between the eye and an object almost to a physical point. It was soon however discovered that these deep magnifiers were imperfect in performance, owing to the small quantity of light they transmitted to the eye, and the contracted field of view consequent on their limited aperture, and more especially on the very unequal refraction of the oblique rays produced by their spherical figure. They maintained their repute notwithstanding, for by their assistance the philosophers of the age were enabled to look into the hidden things of which philosophy had never dreamed; and men were content to strain their optic nerves and tolerate other inconveniences, in return for the advances they were daily enabled to make into a world of knowledge hitherto untracked. When the novelty of these new and interesting observations had in some measure passed, the spherule gradually fell into disuse; and magnifiers of less power, but admitting more light, and presenting a larger field of view, were substituted in its place. It is not however to be understood that the spherule has ever been entirely laid aside; for even at the period when no other method had been suggested for making it than that of melting a thread of glass in the flame of a candle, and when there was consequently to be added to its other inconveniences the formidable one of imperfect sphericity, many persons strongly attached to deep powers, and disposed to consider amplification of the image as the highest achievement of the microscope, held an opinion that no good instrument could dispense with its assistance. Afterwards, when opticians had succeeded in *grinding* minute spheres of perfectly true figure, they came once more into somewhat general use; for in despite of all their disadvantages, they *did* show a physical point of an object distinctly and highly magnified, and this was enough for the mass of observers. Indeed, even in the present day, these spherules are included in the catalogues of our opticians, and are offered to the curious observer, of so deep a focus as one 300th of an inch. All we need say of them is, that they are the very worst class of magnifiers in use at this time. We now come to speak of the recent ingenious contrivances for rendering the sphere a satisfactory magnifying power.

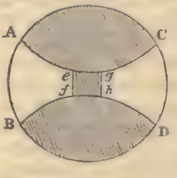
The Grooved Sphere.—Sir David Brewster, it would appear, originated this device, and that being the case, we are at a loss to conceive why a slight modification of it should have obtained the name of the *Coddington Lens;* for the latter appears to differ from the grooved sphere only in its being made more minute, and having the central thickness diminished. The grooved sphere is nothing more than a sphere with a concave groove or hollow, more or less deep, cut round it. The end obtained is a larger available field of view, and an image more clearly defined, in consequence of the extremely divergent rays being cut off and prevented from entering the eye.



A B C D is a sphere having the parts A E C, B F D cut away entirely round it; extremely divergent rays falling upon the surface A B, or C D, would consequently never reach the eye; and by diminishing the central thickness E F, the pencils of rays might be confined so closely within the vicinity of the centre of the sphere, as to reduce the spherical and chromatic aberrations to nothing, in a practical view.

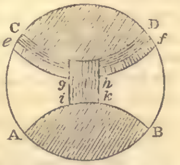
We have a grooved sphere of one-tenth of an inch focus, made by Mr Cary of the Strand, which defines the object beautifully; for an illustration of its penetrating power we refer to fig. 32, pl. 90, representing all the interesting details in the tongue or trunk of a fly.

The Periscopic Sphere.—This is another contrivance by Sir D. Brewster, though he appears to have been led towards it by the periscopic doublet of Dr Wollaston. However this be, he has greatly improved upon the original hint, and produced a sphere which obviates all the inconvenience arising from diminution of light by duplication of surface, and the confusion resulting from spherical aberration. From the several methods of construction, we select the one exhibited in our diagram.



A *e g* C, B *f h* D, are two perfectly similar double convex lenses, united by a small tube *e f g h*, in such a way that their sides A C, B D, may coincide with the surface of the sphere A B C D, of which indeed they form parts. The tube *e f g h*, connecting the centres of the lenses, is to be filled with a fluid, having the same refractive power as they have. The advantages of this construction may be regarded as similar to those of the grooved sphere.

The Periscopic Achromatic Sphere.—This is a third suggestion by Sir D. Brewster for the construction of a microscopic sphere. Referring to the diagram; A B and C D are two double convex lenses, having their outer surfaces portions of the same sphere; they are united at the centre, as in the case of the periscopic sphere, but the fluid occupying the space *g h i k*, instead of being of equal refractive power with the lenses, is to be adapted for the correction of chromatic aberration. A convex speculum *e g h f* is cemented on the lens C D for illuminating the object; and the aperture *g h* cuts off the oblique rays that would otherwise confuse the image and contract the available field of view. We presume this sphere must be very perfect in its definition, as it combines the advantages of the grooved sphere, with an entire correction of the chromatic aberration. The magnifying power is that of a sphere, diminished by a double concave lens, equal to *e f* A B.



Lenses.—The various figures and refractive properties of lenses are fully explained and illustrated under *Optics* (*qu. vide*). The inconveniences attending the use of the small spherule, led to the re-adoption of the double convex lens as a more satisfactory magnifying power, for it was perceived that what it lost in the amplification of the image, was more than compensated for by the increase of light, and the much greater extent of the field of view. The performance of double convex lenses of deep power, though more perfect than that of the spherule, was however less satisfactory than could be wished, the spherical and chromatic aberrations being very considerable. The plane convex lens was then introduced into the microscope; but as this magnifies only half so much as a double convex lens of equal convexity, it necessarily formed, when adopted as a deep magnifier, a portion of a very minute sphere. The exposure of its plane surface to the object, corrected in a considerable degree the unequal refraction of the oblique rays, and gave breadth to the field; but from the extremely small size of the lens, the light was too feeble to render its use pleasant. In these observations we shall be understood to refer to the properties of the convex lens *per se;* for it is scarcely necessary to remark, that in the compound instruments successively invented, the imperfect action of the uncombined lens was to a certain extent overcome. We now come to the consideration of the recent improvements in these simple magnifiers.

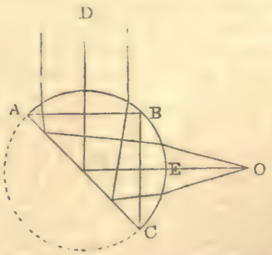
The superiority of the best convex lenses now in use, over those to which we have adverted, results partly from the ratio of their curved surfaces, and principally from the qualities of the diaphanous substances employed in their formation. Glass has a very low refractive power; and this circumstance rendered it desirable that some more suitable transparent medium should if possible be found. The attention of the scientific world was first called to this subject by Sir D. Brewster, who not only clearly defined the desiderata in microscopic elements, but experimented most successfully with gems, and thus led the way to all the improvements in the lens, resulting from the quality of its substance.

The Diamond Lens.—Attention having been awakened to the highly refractive powers of gems, and their consequent fitness for magnifiers, Dr Goring and Mr Pritchard were led to experiment on the diamond; and after a course of persevering and ingenious trials, the latter gentleman succeeded in bringing this precious substance to the spherical figure, and rendering its action satisfactory. Now to appreciate duly the value of a diamond lens, we must bear in mind that the thinner a lens is, or, in other words, the slighter the convexity of its sides may be, the more perfect will be its action as a magnifying power. For if a lens be too thick many rays are dissipated in their passage, and the divergent ones are refracted very unequally; and when the lens is a portion of a small sphere, it is found that diminution of aperture, and consequent loss of light, are a resulting inconvenience. Now a diamond lens, the radius of whose convexity is 8, has equal refractive power with a glass lens curved to a radius of 3; hence, we can either obtain much deeper magnifiers with the diamond, or gain vast advantages from the diminution of central thickness, and the greater radius of the lens. It is only necessary to add that a sphere or spherule of diamond would be totally useless; the highly refractive power causing the focus to fall beneath the surface.

The Sapphire Lens.—The sapphire has a much lower refractive power than the diamond, its radius of convexity being to that of glass for the same magnifying power, as 5 is to 3. A lens of this substance is injured also, more or less, by double refraction, which duplicates and confuses the details of an image. Methods are in use for counteracting this inconvenience to a certain extent; but it would appear that the sapphire is better calculated to give the benefits of large aperture and increased light, than the advantages of a deep magnifying power.

The Garnet Lens.—The colour of this gem would on first consideration appear to render it an unsuitable substance for lenses; yet no great inconvenience is found to result from it, as the tinge is exceedingly slight when the lens is of moderate thickness. The index of refraction in the sapphire and garnet is the same; the latter is however free from the disadvantages of double refraction, and experience decides that it is altogether the most pleasant and useful medium of which lenses can be formed, of course excepting the diamond, whose costliness renders it comparatively inaccessible.

The Cata-dioptric Lens.—This is a contrivance by Sir D. Brewster for obtaining from a hemispherical plano-convex lens a double power, through the joint agency of refraction and reflection.



A B C is a hemispherical plano-convex lens. From an inspection of the diagram, it will be evident that a pencil of rays proceeding from any point in an object at O, will be refracted at the surface B E C, reflected from the plane surface A C in correspondent angles, and, after suffering another refraction at the surface A B, proceed parallel. Consequently an eye at D will see the object magnified twice as much as it would have been by the lens, A B C used in the ordinary manner; since the object is in fact magnified by the two equal plano-convex lenses B E C, A D B, whose focal distance, when acting together, is the *radius* of the sphere of which they, in common with A B C, are parts.

Fluid Lenses.—By a fluid lens is to be understood a small drop of water, or other fluid, suspended in a small aperture in a plate of brass or silver. It will be obvious that a lens of this nature takes an irregular form, the upper surface being somewhat flatted, and the lower one having an elongated sphericity. The construction of this description of lenses is far from being perfect; and we make mention of them in this place only for the purpose of alluding to the scientific efforts of Sir D. Brewster in this department, which may be expected to issue in the formation of fluid lenses possessing the same advantages with those constructed from gems, and having even less eccentricity of action than they have.

COMPOUND MAGNIFIERS.—It remains only, in this department of our subject, that we give a popular description of the compound magnifiers at present in use, named *Doublets and Triplets*, and we shall confine ourselves to a single example of each.

Wollaston's Doublet.—The objects contemplated in this contrivance are deep power, unusual extent of field, and a diminution of chromatic and spherical aberration. This doublet, as first constructed by Dr Wollaston, consists of two plano-convex lenses, the focus of the one being to that of the other, as 3 to 1. The lens of shortest focal length is fixed with its plane surface towards the object, and the other lens is placed over it at a certain distance, with the convex side towards the eye. Mr Pritchard has corrected some apparent errors regarding the nature and construction of this magnifier, and Sir D. Brewster has experimented upon it with his usual talent. The action of the Wollaston Doublet when brought to bear, by a delicate adjustment, on minute transparent objects, is most admirable, and its defining power is worthy of all praise.

Pritchard's Triplet.—This is a construction modelled on the plan of the Doublet, and dependent on the same principles. As the name implies, it consists of three lenses, the third (the one nearest to the eye) having a greater focal length than the other two. When properly centred and adjusted, this combination acts very powerfully in defining and penetrating the details of that difficult class of objects named the *Tests*. It will of course be understood that the gems frequently enter into the composition of doublets and triplets, when, if the selection be judicious, their performance is exceedingly powerful and accurate. We merely add, that the magnifiers just described can be used to advantage only with microscopes of very perfect adjustment; nothing satisfactory can be shown by them unless the focus be most accurately obtained.

THE MANAGEMENT OF LIGHT AND ILLUMINATION.—The improved microscopic elements to which we have briefly alluded, depend for their proper and satisfactory performance on a judicious condensation and adaptation of light. We shall not discuss the subject of monochromatic illumination, as it is a refinement in science of small regard in a popular essay, and is as well little more at present than a suggestion by Sir D. Brewster which *may* issue in some useful practical results. Neither shall we stay to consider the effects produced by polarizing the light admitted to the microscope, as this again is one of the minutiæ in microscopic observation that scarcely comports with the popular use of the instrument. It is sufficient for our purpose to remark upon the reflectors and condensing lenses ordinarily employed in the supply and management of the light. Compound microscopes of the common construction are frequently provided with no other means for adapting the light than a concave speculum; but as these instruments are usually contrived so as to combine the principles of both a simple and compound microscope, this reflector is insufficient to produce the desired effect; for when used with a single lens, it converges the rays of light too much to admit of their filling the field of view, and it produces also an unpleasant glare in the centre, that disturbs and confuses the image. When the compound body is screwed into the object lens, the concave reflector answers well, as its convergence of the rays causes a more intense light to pass through the diaphragm, or small aperture, of the tube, which consequently can better afford the attenuation which takes place in the expanded compound field, than the light which is thrown up by a plane reflector. These microscopes ought, therefore, to be furnished with two reflectors, one plane and the other concave; otherwise their adaptation for simple and compound powers is imperfect. A plane reflector alone, will answer the purpose, if a condensing lens be fitted to the pillar of the instrument so that it may intercept the rays when required, and be made to slide up or down to converge them more or less according to circumstances. The condensing lens will serve another important purpose; for by a *simple* contrivance it can be made to concentrate a strong light upon opaque objects, without which they could not be distinctly seen. It is to be remarked that good day-light answers best for opaque objects under a moderate power of the simple microscope; but when it is wished to examine them with deep magnifiers, an artificial light strongly condensed is required. For transparent objects, natural light is, speaking generally, not well adapted; they come up with a better definition and altogether more satisfactorily when the concentrated light of a lamp or candle is transmitted through them. We have ourselves seldom used the compound microscope with natural light for any object or under any power; and we believe few observations can be made to advantage with it; as the strongest daylight will scarcely afford sufficient light for the field even when the object is transparent, and for opaque objects it is, under the lowest compound power, by far too weak. These general observations apply to the ordinary instruments in use amongst the many, and will not hold altogether with reference to those expensive and elaborate constructions and adjustments which are furnished by the eminent opticians of the present day, to the few who can afford to purchase them.

The advantage of using good day-light, so far as practicable arises from the fact, that the chromatic aberration of lenses is less perceptible by it than by artificial light. By day-light, however, is not to be understood the direct light of the sun, which, except in the case of the solar microscope, is the very worst illumination that can be employed; for it causes such a mist and confusing glare in the field, that no object, transparent or opaque, can be seen by it with due distinctness. It is necessary also to point out the kind of artificial light which is most suitable for microscopic purposes; for observation is frequently defeated and much illusion produced by a bad illumination. The light of a tallow candle, even of a moulded one, is very objectionable; the flame is almost continually in agitation, and the flickerings cause an unpleasant motion in the field, that destroys all the definition of the microscope, however perfect it may be. An argand lamp has been much recommended for its steady and intense light; and if the observer be provided with an instrument having all the necessary apparatus of stops, lenses, and mirrors for its management, it is perhaps the most efficient light of an ordinary nature that can be obtained. We have ourselves seldom used any other light than that of a wax candle, which, if it be not disturbed by a current of air, gives an uniformly steady flame, and produces a fine motionless illuminated field, well adapted for transparent objects. This light, it is true, is not so intense as that of the argand lamp; but we find this an advantage rather than otherwise, so long as we have at hand the necessary means for condensing and directing it.

The quantity of light admitted or transmitted must be regulated by the aperture of the lens and the nature of the object under observation, since too much light is as objectionable as too little. Simple lenses of low power applied either to opaque or transparent objects, do not require a strong light; for they admit a much larger pencil of rays than the deepest magnifiers, and, by consequence, if used with too intense an illumination, they both injure the eye and exhibit the object under a perplexing brilliancy. As the powers increase in depth, the light must increase in intensity; for in ordinary magnifiers the aperture through which the rays are to pass, continually contracts as we ascend to the most powerful amplifiers; and it must be evident that a limited aperture requires a concentration of light that will compensate for the smallness of the pencil admitted through it. A diamond lens will not need so much light as a glass one of the same magnifying power, and for this obvious reason,—the diamond presents a larger surface and takes in a much greater number of rays. The same remark applies in a less degree to the other jewel lenses. Doublets and Triplets are expressly directed to the examination of the minutest and most delicate objects that can be submitted to the microscope; and consequently the due management of the light with reference to them is most important, as the slightest deficiency or excess of illumination is sufficient to perplex the observer. We are not able to give definite instructions on this point, as every observation requires a peculiar adaptation and adjustment; as a general rule we advise that in every case the effect of both oblique and direct rays of different intensity be tried. Indeed no directions can be given on the management of light and illumination that will not require to be modified according to circumstances. To say no more, the variety of the human eye in different individuals would nullify any definite rule that could be laid down. The observer must acquire by practice, and from such general observations as we have offered, the necessary skill and discretion.

Magnifying Powers.—It is desirable that the microscopic cabinet should be provided with a judicious selection of magnifying powers, and the series should have considerable range; since the objects which nature offers for examination are numerous and almost infinitely varied, and each class requires a peculiar amplifying power for its development. An object may be submitted to too high a power, and exhibit nothing to awaken interest or excite attention; but on applying a lower amplifier, a formation is discovered that charms us by its beauty or astonishes by its wondrous arrangement. We look at another object slightly magnified, and it remains an unmeaning atom; yet no sooner do we deepen the power, than obscurity is dispelled, and new information dawns upon us; the small material particle whose presence the unassisted eye could not detect, exhibits a manifestation of creative power, in the contemplation of which all the faculties of the mind are absorbed. Mr Pritchard distinguishes, and with his usual acumen, between the *penetrating* and the *defining* power of magnifiers; the first of these he refers to aperture, or, in other words, to the quantity of rays gathered up, and the latter to amplifiers, whose chromatic and spherical aberrations are under due correction. The penetrating power is necessary to develope the structure of the scales on the wings of butterflies, &c., and the defining power is required for such objects as the hair of a mouse.

The following is a table of progressive magnifiers, whose foci range from one inch to one-thirtieth of an inch, and opposite each lens is placed its focus, and the magnifying power on the line, surface, and cube, assuming distinct unaided vision to be effected at ten inches. These are the amplifiers we have used in our own observations, and by which our illustrative drawings were constructed. We venture to recommend them as a perfectly satisfactory series for general purposes.

	F	L	S	C	
1st Magnifier	1 In.	10	100	1000	These may be used with a compound body.
2nd -	$\frac{1}{2}$	20	400	8000	
3rd -	$\frac{1}{4}$	40	1600	64000	
4th -	$\frac{1}{8}$	80	6400	512,000	
5th	$\frac{1}{10}$	100	10,000	1,000,000	
Coddington Lens	$\frac{1}{10}$	33+	1089+	35,937+	Increase of penetrating and defining power.
Wollast. Doub.	$\frac{1}{20}$	200	40,000	8,000,000	
Ditto	$\frac{1}{30}$	300	90,000	27,000,000	

It is to be observed with respect to the foci of double convex lenses that they always measure from the centre of the medium and not from the apex of the surface exposed to the object; for the magnifying power that is calculated from a focal distance between the object and proximate surface will in some cases be widely wrong, as may be seen in the preceding table, where the Coddington lens of one-tenth inch focus is found to have only one-third the power of an ordinary double convex lens of similar focus. The thickness of double convex lenses does not usually bear any considerable proportion to their focal distances; and hence it produces no important error in a practical view, to take the distance between the object and proximate surface as the true focus. In the case of a spherule, sphere, or hemisphere, however, it is obvious that the thickness of the medium is of im portance and requires to be reckoned in the focal length. The foci of ordinary thin lenses are reckoned thus; that of a plano-convex at the distance of a diameter, and that of an equal and double convex at the distance of a radius, of the sphere of which their respective surfaces are portions. The focus of a sphere is at half the radius, but to this must be added a whole radius, when we wish to ascertain a ratio between its amplifying power and that of the human eye. Hence it will be seen that a double and equally convex lens has a greater magnifying power than the sphere of which its surfaces are portions. As, however, we can produce spheres of much smaller radius than any double convex lens, it is a great advantage to have the means of correcting their performance as magnifying powers. Hemispheres have two foci: if the convex side be towards the object, the focus is at a radius and a third from the refracting surface; but if the plane side be exposed to the object, the focus is then at the distance of two radii; and hence it is discovered that in either case the hemisphere has more than half the magnifying power of the sphere, and that the exposure of the plane surface gives the least power of the two. The same rule holds proportionally with regard to the plane and convex sides of any plano-convex lens. It may be asked, if the exposure of the convex surface gives a greater power, why does the optician always place the plane side towards the object? Simply, to correct in a good degree the spherical aberration, and to effect the transmission of a larger pencil of light,—two important points, which more than compensate for the reduction of power. From what we have observed concerning the foci of common lenses, it will be obvious that there is a peculiarity about those of the doublet and triplet magnifiers. The focus of a doublet measures from between the two lenses, consequently if the focal length be one-twentieth of an inch, the anterior lens must be brought considerably within that distance of the object; and here we discover an objection to the deep triplet, which, from being composed of three lenses, gives a very short focal distance between the anterior surface and the object, and comes down inconveniently close upon the slide. The doublet appears, for the reason above stated, to be better adapted for extreme depth of power than the triplet, which in addition to its inconvenient focus loses much of the light by reflection from the number of surfaces. Mr Cary informs us, "that he has always found a good doublet fully equal in defining power to any triplet."

It will not be out of place to remark briefly on the present rage for deep magnifying powers. The minute atoms which are now subjected to microscopic examination, and the vast *real* improvements and advances in the elements of the instrument, seem to have suggested an idea that the amplifying power of the microscope may be carried to almost any extent with proportionately increased advantages to the observer. The fact is, however, that with all the benefits resulting from improved construction, and the adoption of media of higher refractive powers, we have still to guard against the error of limited aperture and loss of light. There appears to be little advantage, so long as glass is the refractive medium employed, in using single lenses of less than one-twentieth inch focus, or doublets of deeper power than one-thirtieth inch focus. Any thing which they fail to discover will, we believe, be very uncertainly shown by deeper amplifiers of the same medium. Indeed, as an evidence that microscopic discovery does not depend altogether on depth of power, we may mention that we have a double convex lens of one-tenth inch focus, and one-twentieth inch aperture, that shows the markings on the larger scales of the podura with great distinctness, and this object has been, and still is, considered a very severe test of defining and penetrating power. When jewels are employed as the refracting media, of course the amplifying power may be advantageously increased in proportion to their refractive properties. It is however a question whether we should not take the great advantages of large aperture and additional light which they offer, rather than push the amplifying power to its extreme point.

Some difference of opinion still exists respecting the proper mode of expressing the magnifying power. The micrographers of the present day for the most part seem to incline towards the linear measure; but there are some who prefer expressing the power by the magnified surface, and other few who contend for the whole cube. Now it is obvious, that for a mere comparison between different magnifiers it is quite sufficient to state the diametric enlargement, as that gives the simple ratio of their powers; but we conceive the linear measure is not at all satisfactory when we would compare surfaces, unless we mentally, or otherwise, calculate the square, in which case we might as well express the magnifying power at once by the superficial enlargement; and again, the square will fail to give us just ideas of the relative bulk of any two bodies, as this can only be ascertained from the cubic content of each. We are aware that an attempt on our part to revive the practice of computing by the cube would raise a laugh against us; yet, whilst we admit that to say of a one-thirtieth inch doublet, it magnifies twenty-seven millions times, would savour of charlatanism, we must still remind observers that such a doublet really shows a minute object so highly magnified, that twenty-seven millions of such objects condensed into one, would expose a visible surface to the naked eye of no greater extent than that presented by the magnified object. With respect to the magnified surface, we are of the number of those who contend for it as the true measure of the magnifying power: the eye computes by surfaces not lines, and it is most absurd to say that we exaggerate the performance of microscopes by using any other than the linear measure. The preceding table, however, exhibits the powers on the line, surface and cube; and our readers can adopt the measure most satisfactory to themselves.

Micrometer. Our former article under this head refers only to the micrometrical adjustments of telescopes; but it will be obvious that a modification of the same principle of construction applies equally well to the microscope. The name of the instrument sufficiently explains its use, viz., to take exceedingly small measurements, with great delicacy and exactness. In the case of the microscope, the micrometer is designed to measure the actual dimensions of those minute objects that are either barely perceptible by unaided vision, or which from their smallness, are altogether concealed from the unassisted eye. It would unnecessarily extend the present article, to enter into detailed explanation of the various contrivances that are in use for this purpose; we may simply state, that they consist either of cross-wires moved by an extremely delicate adjustment; of minute bodies whose dimensions have been ascertained, such as the globules of the blood, certain small seeds, &c.; or of minute parallel lines drawn at regular distances, on slips of glass, with the point of a diamond. Now, it is obvious, that if with any power of the microscope, we bring one of these measures under observation, in connection with a minute object whose dimensions are sought, we can establish a comparison more or less correct that will solve the inquiry. Sir David Brewster remarks, that "a good micrometer for single microscopes is still, however, a desideratum;" he also observes that "an excellent method of measuring microscopic objects, is to project the image of the object against a divided scale, at a given distance from the eye." Now, this method is precisely the one adopted by Dr Hooke; and as it is the most simple, and for ordinary purposes the most satisfactory means that can be employed, we shall briefly describe and illustrate its application. Any plain scale that is accurately divided will answer the purpose; and it is only necessary to lay it on the table at the foot of the microscope, which should be at such height, that the eye, when making observation, may be just ten inches from the scale. Now, whilst looking with one eye into the microscope, observe with the other the divisions on the scale, and refer the magnified object to those divisions, by which means a diametric measurement of the enlarged image is readily obtained. A person who has never used this method will scarcely believe with what readiness and accuracy, after a few trials, the measure may be determined. Then to ascertain the actual dimensions of the object, nothing more is required than the magnifying power employed. For instance: we observe that a certain object seen through the microscope measures five-tenths of an inch on the scale, and the magnifying power is 200 linear; divide five-tenths therefore by 200, and you obtain one four-hundredth part of an inch, as the actual diameter of the object. The magnifying power itself may of course be readily determined by bringing an object under review whose dimensions are known, and projecting its magnified image on the scale. Thus, if an object one-tenth of an inch in length be projected over two inches of the scale, the microscope has a linear power of twenty. Those who desire fuller information respecting the recent improvements in the microscope and its appendages, should consult *Goring's Microscopic Cabinet*, *Goring* and *Pritchard's Micrographia*, and *Brewster's Treatise on the Microscope*.

THE PREPARATION AND EXAMINATION OF OBJECTS.—A satisfactory development of the nature and structure of microscopic objects, depends altogether on a judicious preparation of the objects themselves, and the application of suitable light and magnifying power. As much disappointment is sometimes felt by persons who pursue their observations without due consideration of these important points, it may not be amiss to lay down a few general rules with reference to them. All objects are either opaque or transparent; and are to be viewed either by rays reflected from their surfaces or by light transmitted through them. Now, as it is inconvenient with any but low powers, and altogether impracticable with very deep ones, to condense a sufficiency of light on the surface of an object, to render observation pleasant and satisfactory, it is generally recommended to reduce opaque objects to transparency, by cutting them into very thin sections. There is a variety of objects, however, that cannot be treated in this way without destroying them, and which must consequently be viewed by reflected light; add to this, that the structure of few transparent objects can be thoroughly ascertained until they are observed both by transmitted and reflected light.

When an object is selected for examination, we must first consider in what way it *can* be treated. If it be opaque, and of such a nature that a thin section cannot be obtained, or if obtained, would give no correct idea of the general structure, it is best to illuminate it with reflected light, and view it under a low power; afterwards detached portions can be observed with a higher magnifier, and the examination of these may perhaps be pursued farther by a judicious subdivision that shall render them sufficiently transparent to admit of light being transmitted, and much deeper magnifiers applied. If the object be naturally transparent, it is advisable in the first place to view it as if opaque, which is easily done by laying it on a stage of opposite colour to its own, and condensing a strong light upon the surface. The observer thus obtains a knowledge of the superficial structure; and may then proceed in his examination by transmitted light, gradually increasing the magnifying power. The surfaces of opaque objects, and the degree of transparency in diaphanous ones, vary very considerably; and hence the supply of light must be limited or increased accordingly. Some opaque objects have such an absorbing surface, that the strongest light is barely sufficient to answer our purpose; others present all the variety of colours, each requiring a peculiar modification of the light; a third class have surfaces so highly burnished that a strong illumination dazzles and perplexes the eye; a fourth class exhibit such a confusion of prismatic reflections, that the light requires not only to be duly modified, but also to be cast upon them at a proper angle, otherwise, we see a gorgeous nothing. And with respect to transparent objects, some are slightly inclined to opacity, and require a very powerful transmitted light to develope them; others are so exceedingly transparent that it is impossible to examine them, except with a faint illumination; and an almost infinite variety lies between these two extremes, every individual difference requiring a modification of light peculiar to itself, and which can be ascertained only by trial.

In the examination of objects, there are two very important points to be attended to with reference to the magnifying powers employed: First, to make the observation with no deeper power than is absolutely necessary to develope the structure satisfactorily; and, secondly, to determine whether it is penetrating or defining power that is needed. The opticians of a century past fell into a great error in the construction of the microscope; they considered that the merits of the instrument lay in a vast enlargement of the field, and a very deep objective power: the consequence was, that they produced enormous images totally destitute of definition, and exhibited under an attenuated light barely sufficient to make darkness visible. Micrographers, taking their cue from the opticians, (or the opticians from them, we know not which) delighted in the use of deep powers; and so long as they could magnify the object to wonderful extent, they appear to have had small concern about the mistiness and indecision that interfered with their observations. No person who is conversant with the microscope, needs to be told that there are objects on which, if he continue deepening the power, they dissolve as it were into nothing. Take the scale of an eel for instance, which comes up sharp and well defined under a linear power of 40, but exhibits nothing that the eye can properly distinguish under a linear power of 200 or 300. There is then a bound beyond which the amplifying power cannot properly extend. Again, as regards penetrating and defining power; some objects that require deep power, need also considerable aperture to penetrate into their arcana: in other words, they require a nice adjustment of magnifying power with sufficiency of light. Other objects depend less on the penetrating than the defining power to develope them. To these latter points we have before alluded.

Considerable ingenuity is exercised at the present day in preparing objects for examination. The opaque are mounted on slips of glass or ivory, with a ground of opposing colour underneath them. If the object, for instance, be yellow, the ground on which it is placed must be green, and a similar contrast is to be uniformly observed, in order that the object, whatever be its colour, may be isolated and presented in full relief to the eye. Transparent objects are laid on slips of glass, and covered with a thin film of mica, which, whilst it keeps them flat, and preserves them from dust, does not prevent the application of very deep powers when necessary. Some objects inclining to opacity, are rendered beautifully transparent by being immersed in Canada balsam, and afterwards placed between two slips of glass, which are to be pressed close together to expell any small air bubbles in the balsam. Many strictly transparent subjects are exhibited to greater advantage when prepared in balsam; and it is to be noticed of this class of objects generally, that they show better when immersed in fluid, either oil, spirit, or water: for the eccentric refraction of the magnifier is considerably corrected by the refraction of those media. The examination of infusorial animalcules is best effected by placing a small drop of the fluid containing them on a slip of glass, and laying a thin plate of mica over it; by this means the fluid is brought to a perfect level, and lies uniformly in the same focus: add to this, the fluid does not so rapidly evaporate as when its surface is exposed. Living objects, and those specially selected to exhibit the circulation of the blood, require a simple apparatus, (usually provided in the microscopic cabinet,) for bringing them properly under observation. Of course a vast multitude of objects present themselves for examination, for the preparation of which no definite rules can be laid down; the observer must necessarily experiment and use his judgment. In this department of our subject, we refer the inquiring reader to *Pritchard's Natural History of Animalcules*, *Goring's Microscopic Cabinet*, *Pritchard's Microscopic Illustrations*, New Edition; and *Pritchard's List of* 2000 *Microscopic Objects*.

Microscopic Discoveries.—A detailed history of microscopic discoveries would occupy more space than our present limits afford, otherwise it would be an interesting task, to trace the progression of human knowledge into the arcana of nature, from the first application of the microscope to the present day. It will answer our purpose, with reference to the past, to advert to the labours of Hooke and Leeuwenhoeck, who may be considered the founders of microscopic science. The latter micrographer used only single microscopes in all his researches; and this circumstance may account for the wonderful truth of his observations, for a simple magnifier shows an object with much greater certainty, so far as its power extends, than the best compound instruments that have ever been invented. A singular error is still perpetuated by many writers, who, when alluding to the microscopes of Leeuwenhoeck, describe them as being spherules only. This misconception was exposed by Baker nearly an hundred years ago, in these words:—"Several writers," says he, "represent the glasses Mr Leeuwenhoeck made use of in his microscopes, to be little globules or spheres of glass, which mistake most probably arises from their undertaking to describe what they had never seen; for at the time I am writing this, the cabinet of microscopes left by that famous man, at his death, to the Royal Society, as a legacy, is standing upon my table; and I can assure the world, that every one of the twenty-six microscopes contained therein is a double convex lens, and not a sphere or globule." The instrument used by Hooke was a very inefficient compound microscope, constructed on the erroneous principle of enlarging the field beyond all reasonable bounds; hence the delineations of objects accompanying and illustrating his micrographia exhibit enormous surfaces with comparatively little detail. Indeed when we consider the difficulties which stood in the way of discovery, we cannot sufficiently admire the zeal and perseverance with which Hooke pursued his researches; and the success with which, by a comparison of many separate observations, he established numerous valuable truths in natural science.

To estimate duly the value of the microscope as a means of enlarging the boundaries of human knowledge, it is necessary to inform ourselves of the utter ignorance concerning some things, and the gross misconceptions regarding others, that prevailed prior to its introduction. Unless we refer to these points, we shall be too apt to look with a smile of self-complacency on the observations of the early micrographers, and to under-rate their discoveries, because recent times, with all the aids and appliances of advanced art, have elicited facts much more interesting and astonishing than any that are recorded by them. Before the invention of the microscope, the mite was considered the least of animated beings, and the existence of living atoms, with which compared, the mite may rank as an elephant, had never been conjectured. The wondrous beauty and contrivance in the formations and appendages of the insect tribes had never been beheld. The miracles of creative power folded up in every plant and blossom, had not been displayed. Vague and indefinite opinions were held regarding the vital fluid in animals; and the manner of its circulation through the body was but imperfectly understood. The strange fallacy of equivocal generation was universally maintained, and fetid corruption was deemed the parent of animal and vegetable life. It would occupy much space to name all the instances of ignorance and misconception that characterized the times in which the microscope was unknown; let those to which we have alluded, suffice to show how limited was the sphere of human knowledge regarding many things that daily met the eye, and how totally unconscious were the philosophers of those ages, of the wonderful creations that science and art were preparing to unveil. "Who," says Baker, "would have imagined it possible to distinguish myriads of living creatures in a single drop of water? or that the purple tide of life, and even the globules of the blood, should be seen distinctly rolling through veins and arteries smaller than the finest hair? That millions of millions of animalcules should be discovered in the semen masculinum of all creatures? That not only the exterior form, but even the internal structure of the bowels, and the motion of the fluids in a gnat or louse should be rendered objects of sight? Or that numberless species of creatures should be made visible, though so minute, that a million of them are less than a grain of sand?—These," he continues, "are noble discoveries, whereon a new philosophy has been raised, that enlarges the capacity of the human soul, and furnishes a more just and sublime idea than mankind had before of the grandeur and magnificence of nature, and the infinite power, wisdom, and goodness of nature's Almighty parent."

The observations of Leeuwenhoeck were directed to every conceivable object in the animal and vegetable kingdoms, and so indefatigable was he in his researches, that had he possessed instruments of sufficient power and delicacy, succeeding inquirers into the mysteries of nature, would probably have found themselves anticipated at every step. He left scarcely any thing unexamined that his microscopes would reach; and though improved constructions have unveiled wonders never revealed to him, they have rarely discovered errors in his observations, so far as they extend. The researches of his predecessor Dr Hooke, for the reason before given, were not so happily conducted; he greatly marred the usefulness of his discoveries by the assumption of unwarrantable hypotheses, and particularly by the pertinacity with which he clung to the doctrine of equivocal generation, though facts were daily disproving the monstrous supposition. In despite of these blemishes, however, he did good service to microscopic discovery; and some allowance ought surely to be made for the aberrations of a mind naturally inclined to speculation, when wonders new and strange were continually rising up before it to excite its energies, and, in not a few cases, to confound them.

The recent achievements of the microscope may be described as accurate examinations in detail of those objects which had been imperfectly observed by the early micrographers, owing to the comparative inefficiency of their instruments; new discoveries in the animalcular kingdom; and experimental inquiries concerning objects progressively suggested by constantly increasing information in the various departments of natural science. There are two classes of objects to which great attention has recently been directed, and concerning which many wonderful and interesting discoveries have been made: these are, infusorial animalcules and the microscopic *tests*. The information obtained respecting the latter class, may by some be esteemed more curious than useful; we believe, however, that few persons, on due reflection, will consider it beneath the dignity of science, to investigate the minutest atom, since it could be produced only by the same creative energy that evoked the universe into being. The elaborate examinations that have been made regarding infusorial animalcules, it will be admitted on all hands, have brought vast accessions to our knowledge of animated nature. Of these atomic germs of vitality, little had been previously discovered beyond the fact of their existence; and indeed many species, on account of their extreme minuteness, and the vast amplifying power requisite for their development, had not till very recently been observed at all. It is not however to their mere existence, that the microscopist now calls attention, but to all the details of their external form and internal structure, to their habits, modes of action, natural instincts, and to all the economy of their being. The mind is overwhelmed and confounded, whilst we read (as Mr Pritchard, in his *Natural History of Animalcules*, has enabled us to do) of the organization and vital properties of a living atom, so inconceivably minute, that five hundred millions of them in a mass would present little more than a sensible point to the unassisted eye. Such an announcement will be met by much scepticism, and scepticism in this instance is indeed pardonable; for with the object before him, the observer can scarcely yield his belief, whilst mathematical truth and actual observation are attesting the fact.

Test Objects.—Many of the improvements recently introduced into microscopic elements, are the results of elaborate inquiries, regarding that delicate class of objects named *the tests;* for the inefficiency of the ordinary constructions is never more apparent than when brought to bear upon them. Dr Goring has the merit of being the first observer of these objects, or at least the first to examine into all their details. His attention appears to have been drawn to them by the remarks of Leeuwenhoeck, on an observation of the wing of a silk-worm moth:—"If we examine the wings of this creature by the microscope, we shall find them covered with an incredible number of feathers, of such various forms, that if an hundred or more of them were to be seen lying together, each would appear of a different shape." The micrographer adds some allusions to "the ribs or streaks in each feather," which the limner he employed had difficulty in discerning under the power of his microscope. It appeared to Dr Goring, from these remarks, that there must be something about these feathers (or rather, *scales*) that fitted them for excellent *tests* of the defining and penetrating power of microscopes. He accordingly commenced an examination into all the varieties of plumage on the wings of papilio; and succeeded, at one and the same time, in developing their wonderful structure, and in determining some of the most important desiderata in the elements of the microscope. The scales of butterflies and moths are the principal tests of penetrating power; they form that impalpable dust which clings to the finger when we touch the wings of those insects. A variety of objects testing the defining power have also been brought under examination; of these the hair of the dermestis, bat, mouse, &c. are very remarkable. We defer more extended mention of these objects, till we come to describe the illustrative engravings.

Infusorial Animalcules.—The term infusorial is applied to the various species of animalcules, discoverable in vegetable and animal infusions. They exist naturally in all stagnant waters, wherein vegetable matter is decomposing; and they can be produced artificially by making an infusion of vegetable substances, and suffering it to stand till it has fermented, and become in some degree putrid. The most rational and philosophical way of accounting for the presence of animalcules in infusions, is to adopt the hypothesis, that the atmosphere is teeming with minute germs of animal and vegetable life,—that they form part of every thing we taste or touch,—but that for their perfect developement a suitable *nidus* is necessary, which nidus is presented in an infusion of some kind or other. These animalcular *ova* it would appear, depend much for the form they are to assume when evolved upon the peculiar nidus in which they are deposited; for the same infusion, in different stages of fermentation and putrescence, developes different species of animalcules. Or perhaps the ova themselves have distinct characters, and the infusion may become successively adapted for the developement of the various species. Leaving this point as one of mere conjecture, we pass on to observe, that optical science has rendered these animalcules legitimate subjects of natural history; and we are consequently to acquaint ourselves, as before observed, not merely with their extreme littleness, but with all the peculiarities that constitute their generic and special differences. We are indebted to Dr Ehrenberg, of the university of Berlin, for much of the information we now possess, relative to infusoria. Prior to his elaborate examinations, they had indeed, to a certain extent, been classified by Muller and others, but they were almost uniformly described as atoms of gelatine matter, having no internal organs, and nourished wholly by absorption. In our necessarily brief description of this interesting class of animalcules, we shall avail ourselves of the kind permission granted us by Mr Pritchard, to extract from his very recent and valuable publications in this department of zoology. "The term animalcule, which implies nothing more than the *diminutive* of animal, has been commonly used to denote those living creatures inhabiting fluids, which are too minute to be scanned, or even seen, by the naked eye: such, for instance, as those produced in inconceiveable numbers from infusions of animal and vegetable matter: it comprehends as well such as are found in, and are peculiar to, the bodies of larger animals: this latter class, however, does not fall within the province of this work."

"In the variety of systems that have been put forth, respecting these extraordinary creatures, the main characteristics of each have referred either to a difference in their size, or to the general appearance of their external forms: the present design, however, is not to investigate the value of these. Until the introduction of vegetable colouring matter into the fluid, which supplies them with food, —an experiment that has been attended with very successsful results,—these creatures were commonly supposed to be entirely devoid of internal organization, and to be nourished by the simple process of cuticular absorption. By the application of coloured substances, which, moreover, have been found to invigorate, rather than depress the animalcule, and to maintain it in the full exercise of all its functions, this erroneous notion is set at rest, and an internal structure is discerned in some, equal to, if not surpassing that of many of the larger invertebrated animals, and comprising a muscular, nervous, and, in all probability, vascular system; all wonderfully contrived for the performance of their respective offices."

"The most obvious portion of their internal structure is undoubtedly that connected with the digestive functions; and hence it is that Ehrenberg has selected this as the leading feature of his arrangement, denominating his two grand divisions of the Phytozoa,—Polygastrica and Rotatoria; the former of which includes such as are possessed of several distinct stomachs or digestive sacs; and the latter such as have true alimentary canals, and rotatory organs, provided with a number of cilia aptly disposed for promoting the objects of life: these two grand divisions of the Phytozoa, are afterwards subdivided into families, and other minor branches. The *cilia*, in their different combinations, supply the means of locomotion, propelling the creature, in many cases, with great rapidity through the water: they are apparently stiff like eye-lashes; and from Dr Ehrenberg's description of some of the larger ones, they issue from bulbous substances at their bases, and being acted upon by muscular fibres, are capable of being moved to and fro, in particular directions, so as to occasion a current of the fluid to flow towards the mouth of the animalcule, by which it is furnished with fresh water, or food. They are sometimes disposed, as before stated, round certain organs of a circular form, which, on account of their peculiar vibrations giving the appearance of a rotatory action, are termed rotatory organs. A second curious feature in the construction of some of these minute creatures, are the *setæ*, or bristles, attached to the surface of their bodies: these short movable hairs in all probability act as fins, and contribute greatly to their means of motion. The third feature are the *Uncini*, or hooks, setaceous appendages curved at their extremities, and serving the creature to attach itself to any object it chooses. A fourth are the *Styli*, jointed at their bases, and differing from the cilia in respect of their being unable to effect a rotatory motion: these, however, are more flexible, and have more play than the *setæ*. Independently of these peculiarities, some animalcules possess the extraordinary faculty of thrusting out, or elongating, portions of their bodies at various points, which assuming the appearance either of legs or fins, are termed *variable processes*, and enable the creature to walk or swim."

"It was a favourite hypothesis with naturalists, some years ago, that the class of animalcules under consideration, was entirely nourished by cutaneous absorption, and that no suitable organs for transmitting and digesting food were discoverable. Baron Gleichen was the first who brought the truth of this theory to the test; for having tinged some water containing animalcules with carmine, he found on the second day, that only some distinct cavities in the interior of their bodies were filled with the colouring matter, evidently demonstrating the existence of an alimentary structure: here, however, he left the subject, and it is to Dr Ehrenberg's further investigation of it, that we are indebted for an accurate description of their different forms. In more recent experiments it has been found advisable to employ vegetable colouring substances in their pure state; such, for instance as sap-green, and indigo, which, together with the valuable accession of an excellent instrument, enabled the doctor to contribute much to our previously imperfect knowledge of this branch of natural history."

"In the selection of vegetable substances for infusions," (for procuring animalcules) "such as stalks, leaves, flowers, seeds of plants, &c., care must be taken that there be no admixture of quinine (bark) in them, or the intention will be frustrated. Immerse these, whatever they may be, for a few days, in some clear water, when, if the vessels which contain them be not agitated, a thin pellicle or film will be discerned on the surface, which, under the microscope, will be seen to be inhabited by several descriptions of animalcules: the first produce are commonly those of the simplest kind called *Monads*. In a few days more, their numbers will increase to such an amazing extent, that it would be utterly impossible to compute those in a single drop of the fluid. After this, again, they will begin to diminish in numbers, and I have generally observed them supplanted by others of a larger species and more perfect organization; such as the *Cyclidia*, *Paramesia*, *Kolpodæ*, &c. It is worthy of remark here, however, that in their production they do not pursue any regular order, even in similar infusions. If the vessel be large, and the circumstances under which it is placed sufficiently favourable, a still higher description of animalcules will succeed, viz., the *Vorticella*, and, lastly, the Brachione; and thus a single infusion will repay for the little trouble of making it with a great variety of species. Water in which flour has been steeped will be found to abound also with animalcules: and it is remarked by G. Leach, Esq., that the leaden troughs, constantly appropriated for birds to drink out of, contain several descriptions of them, and more especially those of the wheel genus. In ponds, too, especially in the shallow parts, near their edges, and in the immediate vicinity of water plants, prodigious quantities of all kinds may be easily procured; so that possessing as we do such myriads of them all around us, that they impregnate almost every thing that we eat, drink, touch, and breathe, an anxiety to know more about them, and the effects they produce, cannot but be regarded as rational and laudable."

"By a careful inspection of the Drawings," (Mr Pritchard refers to the elaborate engravings illustrating his *Natural History of Animalcules*,) "it will be noticed that some animalcules resemble spheres, others are egg-shaped; others again represent fruits of various kinds; eels, serpents, and many of the invertebrated animals; funnels, tops, cylinders, pitchers, wheels, flasks, &c. &c.; all of which are found to possess their own particular habits, and to pursue a course of life best adapted to their peculiar constructions: thus, for instance, while some move through the water with the greatest imaginable rapidity, darting, leaping, or swimming, others merely creep or glide along; and many are altogether so passive that it requires long and patient observation to discover any of their movements at all. One description are perceptibly soft, and yield easily to the touch; another are covered with a delicate shell or horn-like coat. Of the latter order there are different degrees of density, as in the Volvox, Gonium, &c., where the envelope is comparatively thick; and where, strange to say, the internal substance separates by the mode of propagation into several portions, forming so many distinct young ones, which at their birth burst the envelope and the parent becomes entirely dissipated. In others of this order the shell is merely a plate covering the body, resembling that of the tortoise: sometimes it includes the body, so as to leave only two small apertures at the extremities, and at others it is bivalve, and incloses the creature, like that of the oyster or muscle."

"All vertebrated animals are either oviparous or viviparous, which terms sufficiently designate their modes of production: but it is not so with animalcules; for, in addition to these two methods —1. Animalcules propagate by a spontaneous scissure, or division of their bodies into two or more portions, each one forming a new creature, which, on its arrival at maturity, pursues the same course. These divisions take place in some genera symmetrically, as in the Gonia, &c.; in others by transverse, longitudinal, or diagonal sections. In these latter cases the produce have forms differently proportioned from those of the creatures from which they spring. 2. They propagate, in the manner before mentioned of the Volvox, and some other genera, by a distribution of the internal substance of the parent into a proportionate number of young ones, all of which at their birth issue forth, and leave behind them nothing but the invelope, soon to be dissolved. 3. They are produced by germs, shooting forth from the parents' sides. 4. From spawn, which, in the act of being shed, carries along with it a portion of the parent animalcule."—*Pritchard's Natural History of Animalcules*, book I. p. 12—20.

In the foregoing extract we have given Mr Pritchard's lucid and perspicuous summary of all the peculiarities connected with infusorial animalcules; and we have studiously avoided any verbal alterations or omissions beyond what were absolutely necessary to its present isolated position. We feel that we have pushed our license to the extreme by quoting so largely; but we could not by a shorter excerpt have conveyed the information we desired, and indeed, had we attempted to do so, we should probably have presented the author's statements in a mutilated and garbled form, discreditable to ourselves and injurious to the character of his work. As we are farther indebted to Mr Pritchard for permission to copy a variety of figures from his book, we must necessarily refer to it again in the course of describing our illustrations. We trust, however, that we shall not be found to have misused the liberty conferred; and that all our excerpts, much as they must add to the value of the present essay, will only serve to convince the naturalist and curious inquirer, that his book is a necessary addition to their libraries, both with regard to copiousness of information, and the extreme truth and beauty of the illustrative engravings.

It would lead us too far away from the legitimate design of the present article to detail a variety of additional and interesting particulars relative to the Infusoria, that are recorded by Ehrenberg;—it may, however, be proper to make brief allusion to them. He has clearly demonstrated that the Infusoria are furnished with mouths and teeth, and he has even ascertained the number of the latter, their consistency, and characteristic differences. He has found them to be provided with assistant organs of digestion, respiratory organs, and a perfect vascular and nervous system. Even the eyes of these minute objects have been made the subject of his examination, and many remarkable particulars concerning them have been ascertained. Regarding their fecundity it is sufficient to state, on the professor's authority, that a single animalcule will in the course of three or four days become a multitude of separate existences, of whose number the human mind can form no idea. The inquiries of the same unwearied observer, relative to *fossil infusoria*, have issued in such amazing results, that we dare not in our narrow limits even trace their outline. Let it suffice to state—it is now an ascertained fact, that a large proportion of the siliceous formations of this terrestial globe, are actually composed of the testaceous coverings of Infusoria.

In completion of our design in the present article, we now proceed to describe and remark upon the accompanying engravings illustrative of microscopic discovery. We would just observe, in this place, that we have purposely taken an extended range in the selection of objects, to show the inquirer into nature's mysteries, that an examination of details, throughout the whole compass of animate and inanimate matter, presents much to interest and instruct; we have likewise employed extreme powers for their developement, it being our wish at one and the same time to exhibit what the *microscope* can do in all its efficiency, and what the *observer* can do with an instrument of very limited powers.

A very interesting and remarkable class of microscopic objects is presented in the hairs of different animals, which exhibit a most wonderful variety and delicacy of formation. Hooke, Leuwenhoeck, and others, endeavoured to discover their peculiarities, and to a certain extent they succeeded; but the instruments used by these early micrographers, wanted the defining power necessary for the perfect development. We have introduced seven varieties into our illustrative engravings, and from these we believe a good general idea may be formed concerning this description of objects.

Plate 90, fig. 1. *The hair of the Dermestes.*—This insect belongs to the order *Coleoptera*, (see Entomology), and is remarkable for the beautifully formed hair which covers it in the larva state. There is a variety in the structure; some of the hairs resembling an oat bread, and others exhibiting the character shown in our specimen. A more delicate and beautiful object than the spear-shaped hair can scarcely be submitted to the microscope. The lowest power by which it can be seen, is 100 linear, but to develope its details satisfactorily, a power of 200 linear is requisite, which is the one we have used. This object is considered an excellent test of the defining power of a good microscope.

Fig. 2. *The hair of a Mouse.*—The characteristics of this object, when viewed by transmitted light, are dark transverse stripes, some of which are broken, whilst others extend quite across the hair. On closer observation these appearances are discovered to arise from a kind of spiral spring occupying the tube of the hair, and a number of imperforations on the surface.

Fig. 3. *The hair of a Bat.*—From the resemblance between the mouse and bat, it will excite a little surprise to observe the very decisive difference of structure in the hair of these two animals. That of the latter sometimes presents the appearance of a screw, or of a number of small conical cups inserted into each other; other specimens seem to be formed of two distinct hairs twisted together; and some exhibit, in connection with these peculiarities, striped markings resembling those on the hair of the mouse.

Fig. 4. *The hair of a Bee.*—This is a very beautiful object, but requires a good defining power to show the structure satisfactorily. The hair itself resembles a jointed bamboo cane; and from each joint small delicate spikes shoot out. The hair terminates in a number of these spikes, one of which is uniformly longer than the rest.

Fig. 5. *The hair of a Dormouse.*—This object very much resembles the hair of a mouse. The points of difference seem to consist in the regularity of the stripes on that of the dormouse, and its greater delicacy.

Fig. 6. *The hair of a Mole.*—This is a very singular structure. The interior exhibits the remarkable spiral observed in the hair of the mouse and dormouse, and the exterior presents a formation somewhat similar to that of the bat's hair.

Fig. 7. *The hair of a Caterpillar.*—We notice a strong resemblance between this object and the hair of a bee. The tube of the hair is not jointed, however, in the caterpillar; and the lateral spines curve the contrary way. This and the preceding figures are all shown under a doublet linear power of 200.

Fig. 8. *A filament of Feather Down.*—This exhibits an exceedingly minute formation that was observed under a doublet linear power of 300. The exquisite finish of the joints was very remarkable.

Fig. 9. *The Down of a Flower.*—The down of flowers may in some cases be termed a parasitical plant that is nourished by the florescence to which it clings till it is able to provide for itself; in other cases, it is an appendage to the seeds of the plants with which it is connected, and furnishes them with means of conveyance to places far distant from the parent flower. To this wonderful provision of nature for the propagation of vegetable life, we are to attribute the verdure and floral loveliness of those wild sequestered spots, where the cultivating hand of man has never been employed, and where the human foot has rarely trod. The summer gale wafts these vegetable fibres over the earth; they alight in their course, cling, take root, and ultimately spring up an hundred fold. The formation of the down of flowers, presents a wonderful variety. It sometimes appears plain and smooth, at others, rough and thorny, with little hooks or barbs, by which the fibre clings to the spot where it has fallen, and is enabled to strike root into the earth. There is no class of microscopic objects more interesting and instructive than this; and the details of the various species may, in most cases, be developed satisfactorily by an instrument of very moderate power. The object shown in the engraving is a fibre of thistle down, as it appears under an amplifying linear power of eighty.*

When speaking of the test-objects, we noticed a remark by Leeuwenhoeck, regarding the scales of butterflies,—"that if an hundred, or more, of them were to be seen lying together, each would appear of a different shape." Now, though this observation is strictly true, inasmuch as there is the same variety exhibited in the formation of these atoms as in that of the human countenance, still this is not the grand point of admiration; the most wonderful fact connected with them is, that amidst all the variety of individuals, we no more mistake the different species of these scales, than we do the various species of the human race, in consequence of the great variety of features observable in each. Let Materialists, and Owenites, and all who would dethrone Deity, and deify nature, inform us regarding those subtile laws which determine with such wonderful exactness the formation of these atoms. If brute matter possesses an inherent plastic energy to mould existences like these, let us no longer exalt mind and reason, but refer them to a subordinate place. If, however, we refuse reason priority of place over mere matter, what becomes of the reasoning of these men? There's the rub.

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* We have expressed the magnifying power in linear measure, with reference to this and the preceding objects; the reason for doing so will be obvious.

Fig. 10. *Scale of the Red Underwing Butterfly.*—This minute atom exhibits a very beautiful formation, under a deep power of the microscope. The longitudinal striæ are resolved by a good penetrating power into what may not unaptly be termed strings of beads. It is asserted that this appearance in the object under review, and in others of this class, is produced by the interlocking of the serrated edges of the fibres composing the scale. We have not ourselves observed anything confirming this opinion, and therefore content ourselves with exhibiting the object as we saw it, under an amplifying power of 90,000 on the surface. To avoid repetition, we may observe that the power just mentioned applies to the succeeding objects so far as No. 20, inclusive.

Figs. 11, 12, 13. *Scales of the Brassica Butterfly.*—These are three varieties of scales from the wings of the Brassica. Fig. 11, resembles in the striæ the scale of the red under-wing; but there is a marked difference in the contour of the two objects. Fig. 12 exhibits a very delicate and transparent scale, with exceedingly fine longitudinal striæ. We consider this object a very severe test of defining power, for many instruments that will show the markings of the podura with much distinctness, fail to develope it; it requires a very skilful management of the light, a most accurate adjustment, and a faultless doublet, to exhibit it satisfactorily. Fig. 13 is termed the Brassica *curiosa;* it is no less remarkable for its exterior form, than for the singular disposition of the striæ on its surface.

Fig. 14. *Scale of the Menelaus Butterfly.*—This object consists of a fine tissue overlaid with strong and well defined lines. The latter are frequently detached from the tissue, or membranous part, as shown in our specimen; and consequently there can be no illusion or misconception regarding these lines, which are evidently fine fibrous cords in relief, upon the surface of the scale.

Fig. 15. *Scale of Papilio.*—This is a very singular scale observed amongst a miscellaneous group. The longitudinal striæ are strongly defined, and the cross markings arise from a contraction, or shrivelling up, of the membraneous part between each two of the striæ.

Fig. 16. *Scale of the Azure Blue Butterfly.*—The light coloured and most diaphanous scales of this species form beautiful test objects for the microscope. The striæ are delicate, but are easily defined by a good doublet.

Fig. 17. *Scale of the Podura.*—The podura, or skiptail, a small insect found in wine cellars, is most readily obtained by examining a small quantity of the dust in which the wine is packed,under a moderate power of the microscope. This little creature is covered with exceedingly minute scales, which have been adopted as microscopic test objects of the very first class. A most accurate adjustment, excellent defining power, and a judicious management of the light, are requisite to develope this delicate structure. The longitudinal striæ are brought out with most difficulty, though some observers contend that the waved lines, frequently observable on the larger scales, are a more severe test.

Fig. 18. *Scale of the Lepisma.*—The lepisma is a small fish-shaped insect, of pearly whiteness, covered with a number of delicate scales, one of which is shown in our engraving. The striæ on this object are easily developed, and they have the same character with those on the scale of the menelaus, as is evidenced by the partial detachment of the lines from the membraneous tissue. There is a variety in these scales: the one we have selected, and on which the markings are more delicate, is nearly oval-shaped; but there are others much resembling a shell, and having the upper edge scalloped very regularly. Diagonal markings are perceptible on most of the latter species; these appear to be produced by spiny projections from the longitudinal lines.

Fig. 19. *Scale of the Diamond Beetle.*—Every possessor of a microscope will be familiar with the wing-case of the diamond beetle,—one of the most beautiful opaque objects on which the eye can rest. We may compare the appearance it presents to that of the ancient Jewish breast-plate; a number of small cavities, regularly disposed over the surface, are filled with a vast number of small scales, which reflect every variety of hue, and exhibit a lustre and magnificence that dims the splendour of the most richly arranged jewellery. Our figure shows one of these minute scales, with its semi-opaque spots and striated markings.

Fig. 20. *The scale of a Moth.*—This object is very opaque, compared with preceding ones, and it is consequently difficult to trace its structure with much precision. The contour, it will be seen at once, is that of a leaf; and the vegetable analogy would seem to extend much farther. This scale appears to consist of a fibrous frame-work, resembling very much the skeleton of a leaf; and the interstices are filled up with a mossy substance, whilst the prismatic reflections, and other characteristics of the surface would indicate that smaller scales are scattered over it.

Fig. 21. *Disposition of the Scales.*—This is a small diagram, intended to convey an idea of the disposition of the scales on the membrane of a butterfly's wing. The double lines of points mark the places where the scales are inserted; and it will be noticed that there are two sets of them, one considerably shorter than the other. The longer scales are inserted in the upper line overlapping each other, and the shorter, in the line beneath; by which means these extend to the middle of the long scales, and have their extremities covered by the next line.

Figs. 22, 23, 25. *Wings of Insects.*—To have given with full effect the remarkable details in the wings of insects, we must necessarily have shown them on a very large scale, and by consequence have restricted our illustrations to a very small number, which would not have fulfilled the design in view. The reader will therefore consider these figures as little more than an indication of the wondrous beauty, delicacy, and variety discoverable in this class of objects. Indeed, the amplifying power under which they are shown, is scarcely 60 on the surface. Fig. 22, exhibits the wing of a gnat with the beautiful fringe on its circumference, the spinated fibres, and the delicately marked membrane. Fig. 23, shows the general character of the wing of the ichneumon fly. Fig. 25, is the beautiful shell-shaped wing of the earwig. These three objects come up in a very pleasing and interesting manner under a compound power, sufficiently moderate to keep the whole figure in the field.

Fig. 24. *Foot of a Dytiscus.*—This figure exhibits, under a very low power, the foot of that most

voracious aquatic fly, the dyticus. Our illustration is confined to the strong claws or talons with which it is armed, but a more important and interesting feature is the web that surrounds the foot; this, however, from its complicate structure, could not have been effectively shown on a small scale.

Figs. 26, 31, 34, 35, 36. *Feathers of the Humming Bird, and details.*—These figures embrace many interesting particulars connected with the minute feathers of the humming bird. The complete feathers (Figs. 31, 35.) are about one-tenth of an inch in length. We commence with Fig. 35, which exhibits a singular feature in these objects—a number of long slender pods (such we term them) of a bright orange colour. Fig. 34 shows one of these pods enlarged, and Fig. 36 one of the fine lateral fibres very highly magnified. In process of time these pods burst open, and assume the character indicated in Fig. 26; and ultimately the whole feather takes the character shown in Fig. 31.

Fig. 27. *Transverse Section of a Hedge-hog's quill.*—Remark on this object is unnecessary. Power, 100 on the surface.

Fig. 28. *Farina of Flowers.*—Few persons can have failed to notice the fine powder on the tops of flowers; this is the farina, or pollen, necessary to the propagation of plants. Without the aid of the microscope, however, we could never have discovered the various beauty of the impalpable atoms composing this flour-like substance. Fig. 28, is the farina of the marsh-mallow, which consists of small globes, thickly studded with prickles.

Fig. 29. *Seed of the Calampelus Scaba.*—This object is shown under a very low power, the intent being merely to define more clearly the singular fringe round it, an appendage provided to facilitate its transit over the earth.

Fig. 30. *Seed of the French Marigold.*—This remarkable seed is particularly worthy of observation; it is here shown under the low power of 100 on the surface, our space not admitting a larger figure of it; but when examined in detail with deeper magnifiers, a wonderful structure is exhibited, which is only indicated in our view. The true character of the spinated fibres, forming what we may term the wings of the seed, may be seen in Fig. 9. It will be evident, at a glance, that this vegetable embryo is wafted from the parent stem by the gentlest gale; and when deposited in a favourable spot, the barbed fibres facilitate its entrance into the soil on which it has fallen.

Fig. 32. *The Tongue or Trunk of a Fly.*—Here is one of the most interesting and beautiful objects that can be submitted to the microscope; and an instrument of very limited power is able to develope its principal features. Our anatomical knowledge does not enable us to describe all the parts and define their uses; we shall therefore content ourselves with quoting Baker's remarks. "The trunk of a fly consists of two parts, folding over one another, and sheathed in the mouth. The extremity thereof is sharp like a knife, for the separation of anything. The two parts can also be formed, occasionally, into a pair of lips for taking up proper quantities of food, and by the fly's sucking in the air, they become a kind of pump, to draw up the juices of fruits or other liquors." This object is shown under the amplifying power of a Coddington lens of one-tenth inch focus.

Fig. 33. *Polypody and Seed of the Oak.*—There is a species of fern, called *polypodium*, which grows parasitically on the bark of the oak. The seed of this minute plant is contained in a kind of bag, or pod, and the number of seeds in each pod corresponds to the divisions on its circumference. These objects are shown in our figure, as detailed by a superficial magnifying power of 40,000.

Plate 91, fig. 37. *Leaf of Bog Moss.*—This is a very delicate structure, about the tenth of an inch in length, and forms a very pleasing transparent object. A superficial power of 100 (the one we have used) is sufficient to define it perfectly.

Fig. 38. *Species of Sea-weed.*—This object is viewed under the same amplifier as Fig. 37.

Fig. 39. *Tranverse Section of the Aloë.*—Under the same power, of 100 on the surface, is here shown the beautiful structure of the aloë wood. Our space would not allow the introduction of the entire figure.

Fig. 40. *Fibres of the Palm.*—The singular formation and extreme delicacy of the fibres of the palm, as developed by a superficial power of 90,000.

Fig. 41. *Fossil Insect (?)*—This object has peculiar interest for the geologist, to whom we freely resign the task of determining its history. It has been discovered in a siliceous formation, at Uckfield in Sussex. A very thin section of the flint, scarcely half an inch square, forwarded to us by Mr Cary of the Strand, contains no fewer than ten of these insects, which, it will be seen, bear a very strong resemblance to the mite. Our figure shows the object, on rather an enlarged scale, as developed by a superficial power of 90,000.

Fig. 42. *Seed-vessel of Moss.*—This curious receptacle for the seed of moss is shown under the superficial power of 100.

Fig. 43. *The Trunk of a Bee.*—That "the bee sucks honey from every flower," is a fact familiar to the youngest amongst us; but the nature of the apparatus with which it is provided for this purpose, is not so generally known. The trunk or proboscis of the bee is here shown, under a square power of 100, which is fully sufficient. The resemblance to the trunk of an elephant will be at once detected, not so much in the termination, as in the parallel rings that extend along its whole length, these latter enable the insect to curve, contract, or stretch out its trunk at pleasure. This object is well worthy of observation, and it is one of those which come within the reach of every instrument.

Figs. 44, 45. *Crystals of Common Salt.*—The primitive form of these crystals is a cube, but they frequently combine and produce an eight-sided figure, which is nothing more than an aggregation of cubes rising in layers above each other. Sometimes these compound crystals present only plane faces, as in Fig. 44; at others the process of accumulation is distinctly marked by parallel lines, as in Fig. 45. It is most beautiful to witness the actual formation of these crystals under the microscope, which is easily done by dissolving a few grains of salt in a drop of water, and wetting a slip of glass with the solution; then placing the glass under the object lens, and adapting the focus, you observe, as the moisture evaporates, the formation and gradual increase of the crystals. As there is a decisive difference in the crystals of the various salts, a vast fund of entertainment and instruction may be drawn from an observation of the different species, and even from the variety of figures which one solution presents to view.

Figs. 47, 48, 52. *Crystalline figures of Common Salt.*—A solution of common table salt presents, in addition to the perfect crystals, a variety of singular configurations. Fig. 47. resembles a coralline formation, and is composed of a vast number of small cubes irregularly disposed, which from their extreme minuteness exhibit, under the most powerful magnifiers, only an aggregation of shining dots. Fig. 52 is a similar formation, except that all the lines are parallel or at right angles to each other. Fig. 48. is a more complicate configuration; the middle stem is first formed, and afterwards the processes on each side branch out. This formation much resembles a crystallization of soda.

Fig. 46. *Crystals of Saliva.*—If a slip of glass be wetted with the tongue, and afterwards submitted to a powerful amplifier, the gradual evaporation of the moisture will discover a crystalline formation very much resembling Fig. 52.

We advise those who may take an interest in witnessing the astonishing process of crystallization, as developed under the microscope to use a compound instrument, which gives them extensive field, and considerable power, yet enables them to keep the object at some distance from the lens, by which the evaporation of the solution is less liable to condense upon the objective glass, and disturb the observation.

Figs. 50, 51. *Snow Flakes.*—An almost infinite variety of form is observable in the minute crystals of a snow flake; the beautiful and complicate figures they present are truly wonderful, and fully reward the observer for the frequent disappointments he must suffer in attempting to bring them effectively under the microscope. The specimens shown in our engraving are copied from the delineations of other observers.

Fig. 49. *A Transverse Section of the Clematis.*—The delicate structure of this object is shown under a superficial power of 400.

The remaining 17 figures, viz., from Fig. 53 to Fig. 69, inclusive, refer to Infusoria. For these, we have before noticed, we are indebted to Mr Pritchard, who permits us to copy them from his *Natural History of Animalcules;* from the same talented and beautifully illustrated work we extract so much as is necessary in the way of particular description and general information. It will not be out of place to notice here, that Mr Pritchard has caused copies of his elaborate engravings to be delicately and accurately coloured; and we can scarcely conceive a more valuable companion to the microscope.

The subjoined table exhibits the genera of the Infusoria, the number of species included under each genus, and the individuals selected for illustration of special character.

Genera.	No. of Species.	Individuals.	Fig.
1. Monads.	21.	The Drop Monad.	65.
2. Proteus.	3.	The Melting Proteus.	66.
3. Volvox.	13.	The Vegetable Volvox.	67.
4. Enchelis, with the Bacterium of Ehrenberg.	33.	The Egg-shaped Enchelis.	61.
5. Vibrio, including Bacillaria, Phytozoa, Entozoa.	59.	The Stick Vibrio.	68.
6. Cyclidium.	12.	The azure Cyclidium.	62.
7. Paramæcium.	7.	Paramæcium chrysalis.	63.
8. Kolpoda.	16.	The Cuckoo Kolpoda.	64.
9. Gonium.	7.	The Breast-plate Gonium.	69.
10. Bursaria.	5.	The little Swallow-like Bursaria.	60.
11. Cercaria.	25.	The Green Cercaria.	59.
12. Leucophrys.	28.	The Bracelet Leucophrys.	54.
13. Trichoda.	91.	Trichoda vulgaris.	55.
14. Kerona.	14.	Kerona pullaster.	56.
15. Himantopus	7.	Himantopus larva.	58.
16. Vorticella, including Polygastrica, Rotatoria.	70.	Vorticella cyathini.	57.
17. Brachiouus.	22.	Brachionus passus.	53.

It will be noticed that in stating the number of species under each genus, we confine ourselves to those figured and described by Mr Pritchard; this explanation is necessary, as in some genera the species are more numerous in the arrangement of other naturalists.

Monads.—"This genus of animalcules includes the smallest forms in which a voluntary motion has been observed, even under the most powerful microscopes: this motion, until recently, appeared to be the only property of life with which they were endowed; but the observations of Dr Ehrenberg demonstrate an organization equally perfect with animated beings of much larger dimensions. Their forms in general are simple, spherical, or cylindrical masses, devoid of external members or processes:* the mouth, which is with difficulty discerned, is a simple orifice, not furnished with ciliæ or hairs, (except in one or two species:) they are colourless, and transparent as the clearest crystal, yet can no internal organization be seen, excepting that connected with their digestive function, which consists of two or more globular cavities or sacs, probably communicating with each other by a tubular membrane, as in the larger polygastric animalcules, but which in this genus is too minute to be discerned; indeed, the stomachs or sacs themselves are only to be observed when the animalcule is fed with particles of colouring matter: the food on which they usually exist being as pellucid as themselves, the cavities are invisible. They increase by a spontaneous division of the parent into two or more parts, and those parts, or young, again divide when they have attained their full size."

"As subjects of observation they are principally interesting from their minuteness, being as they are, the very limit of man's acquaintance with animated nature. Their diameters vary from 1-24000th of an inch to 1-1200th, and consequently require a very high magnifying power to discern. They are numerous, and generally found congregating at the surface, and around the decomposed matter of infusions, either of vegetable or animal substances."

Fig. 65. *The Drop Monad.*—"This animalcule is larger than the Atom Monad, and somewhat globular. On account of its size and transparency, its digestive cavities can be much more distinctly observed. It revolves about its longer axis, and in swimming, that part which contains the coloured particles follows the colourless part. Occasionally, with attentive observation, currents in the water may be seen about the fore-part or mouth; it is therefore highly probable that it is furnished with ciliæ or hairs. Those found at Petersburgh, measured from 1-3000th to 1-2300th of an inch in diameter: they are represented in the group magnified 380 times." †

Proteus.—"We now arrive at a larger genus of animalcules, whose habits are highly interesting and curious: indeed there are few in the examination of which I have been more delighted. This gratification arises, not so much from any complexity in their organization, which in comparison with the *Brachionus*, and some of the Vorticella, is more simple, but from the great power they possess of dilating their bodies; and their motions being slow, the observer is enabled to examine their changes of form distinctly. Their generic character, according to Müller, is, 'that their form is changeable, extending variable feet-like processes at pleasure.'"

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* My observations on the *mona punctum* require a modification of this part of the definition, or removal out of this genus. A. P.

† Mr Pritchard merely states the magnified diameter.

Fig. 66. *The Melting Proteus.*—"The drawing of this animalcule I took from a specimen found in some water containing duck-weed (*lemna major*), in the month of March. They are very scarce. Müller states he only saw them twice. Their diameters vary from 1-600th to 1-300th of an inch."

Volvox.—"The animalcules belonging to this genus are of a globular form, and revolve in the water. Some of the species are so large as to be discerned by unassisted vision, while others are very diminutive. Ehrenbreg has not demonstrated their digestive organization; but in a note to his table, conceives they ought to follow the monads. In this genus is included that beautiful animalcule, called the *Volvox globater*, which forms so interesting a spectacle in the solar and gas microscopes."

Fig. 67. *The Vegetable Volvox.*—"This animalcule is rather scarce. Its most interesting character is the short time which it requires in arriving at maturity, and undergoing all its changes. In the space of half an hour, when fed with an infusion of indigo, a single globule may be observed to emerge from a naked branch, increase in size, and divide into a cluster of smaller ones; these increase also, and after revolving, and bringing a current of food towards them, finally separate, and swim away, each of the young ones commencing a similar course."

"It consists of several opaque branches: at the termination of each is a small congeries of egg-shaped transparent bodies. Müller, who seems to have only seen them once, mistook them for a vegetable production, until he observed the clusters to separate from the branch, and swim about at pleasure."

"These animalcules produce a rapid current of water towards them as indicated by the arrow in the figure; and if supplied with plenty of coloured food, as indigo, they will not only assume the colour of the particles, but may be seen to increase in size, under the eye of the observer. When the cluster is fully developed, it breaks off, and swims away, revolving as it proceeds. After roving about for a few minutes in search of a proper nidus to attach itself to, it spins a very delicate thread, like a spider's web, one end of which it fixes to the substance it has selected: this filament, when drawn out to the proper length, increases in size, and assumes the deep blue colour of the indigo, while the end of the stalk which it left shoots forth a new cluster. The current above mentioned is sometimes produced without any revolution of the cluster of globules, at other times I have observed the whole cluster to revolve. The magnifying power which I employed, while making the drawing of this figure, was nearly 500 times. The medium diameter of the clusters, while attached to their branches, I find to be about the 800th part of an inch; and when fully developed and separate, about 1-400th of an inch. Müller discovered these animalcules in river-water in the month of November. Those on which the above observations were made, I found in the month of June, in some pond-water."

Enchelis.—"This genus of animalcules, according to Müller, contains twenty-seven species. His definition is, 'a simple invisible animalcule, of a cylindrical form.'" "The size of the different species varies considerably, and therefore requires different magnifying powers to exhibit them (from 200 to 500 linear). If the reader have an opportunity of examining any of them, in instruments of different constructions, but of the *same* magnifying power, he will readily perceive that there is something besides magnifying power that is essentially requisite in a microscope, in order to show the details of objects."

Fig. 61.—*The Egg-shaped Enchelis.*—"This animalcule is distinguished by its pellucid appearance, and the longitudinal folds of the external membrane. A few bright spots are also sometimes observed; these have been supposed to be the ova, but it is more probable they are the sacs of the polygastric structure. The figure is a magnified representation, showing the sacs and folds, neither of which are constant. Found in stagnant water."

Vibrio.—"The extensive range of this genus, in regard to the structure, form, and size of the different species, offers great variety to the observer." "It includes animalcules, both membraneous and crustaceous: some as slight as a thread, others whose breadth nearly equals their length; some whose organization is so complete that modern naturalists have entirely excluded them from the phytozoa; and others, which are with difficulty distinguished from vegetables. To diminish somewhat these incongruities, without rendering the arrangement complex, I have separated them into three divisions. The first is the simplest, and requires a magnifying power of from 200 to 500 times to examine them; the second and third vary so much in size that some do not require half that power, and a few even less, being just descernible by the naked eye. The definition given by Müller to the animalcules under this name, is, an invisible worm, *very simple, round, and rather long.*"

First-division,—Bacillaria. "These minute and inactive animalcules are covered with a hard shell-like coat, and appear closely allied to some of the fresh-water Algæ, and are not very appropriately classed with the *Vibrio.*"

Second division,—Phytozoa. "This term was first made use of by Goldfuss, and is confined by Ehrenberg to those microscopic creatures whose digestive organs are polygastric, or, if they possess a simple alimentary canal, it is always accompanied by rotatory organs."

Third division,—Entozoa. Includes those animalcules of the Vibrio genus, which "possess an alimentary canal, but no cilia, nor occasion currents when immersed in a mechanical solution of coloured particles."

Fig. 68. *The Stick Vibrio.*—"This animalcule, or rather congeries of animalcules—for they are mostly attached together in different forms—when magnified appear like pieces of straw of a pale yellow colour, with the inside of an orange brown. They are nearly round, and, if attentively watched, may be seen occasionally to turn upon their longer axis, when a longitudinal line may be observed; this is probably the hinge or opening of their shell. They vary in length from 1-100th to 1-500th of

an inch, and their diameter is from 1-20th to 1-100th of their length: they require considerable magnifying power, and large angular aperture, to distinguish their structure." "I find, on reference to my notes, made at different times, that it was not until after I had examined them repeatedly, I became satisfied of their animal vitality. They generally reside at the bottom of ponds, but after rain are met with near the surface, giving the water a green tint; in such cases they are found separate, the agitation of the water having broken the clusters."

Cyclidium.—"This genus is composed of animalcules of a flat, round, or oval form, without any apparent cilia. Like some others, they are so very diaphanous that the most delicately finished engravings of them, afford but a faint idea of their exquisitely brilliant, crystal-like appearance, when viewed under a good achromatic microscope of large angular aperture."

Fig. 62. *The Azure Cyclidium.*—"Is of a flat oval form. In its usual condition it is pellucid, but when fed with colouring matter, dark spots may be seen, as in the drawing. In swimming it sometimes rotates, and exhibits its narrow side to view; and if the water be filled with opaque particles, a current may be perceived towards the front of it, indicating the presence of cilia, which, however, can only be seen when the animal is expiring. These creatures propagate by division, during the progress of which they alter their form. They require a magnifying power from 400 to 800 times to view them distinctly. Length, 1-1400th to 1-1800th of an inch."

Paramaecium.—"The animalcules included in this genus, are membraneous, long, and rather flat. Ehrenberg supposes these and the kolpoda to be the same as the monads, and cyclidia, at a more advanced stage of their growth."

Fig. 63. *Paramaecium chrysalis.*—"These interesting creatures appear like milk white specks to the naked eye. They are soft, and yield to the pressure of any hard substance they may come in contact with. The body is long, and in some positions the cuticle appears to have a diagonal fold, as shown in the figure. The mouth aperture is situated on the inferior side, near the middle, and in some views it appears like a papillary projection. In good microscopes the body is seen covered with longitudinal rows of hair; by means of these, the creature is enabled to produce a current in the water towards its mouth. They propagate by transverse division. These animalcules are well adapted for exhibiting the structure of the alimentary organs, as they are of sufficient magnitude to render the sacs clearly perceptible, when filled with coloured particles. On the introduction of indigo into the water they are greatly agitated; in a few minutes, however, they are quiet, and the digestive sacs become coloured, as in the drawing, when from 100 to 200 may be enumerated. Length, 1-85th to 1-200th of an inch."

Kolpoda.—"This genus is thus defined by Müller: 'an invisible, very simple, pellucid, flat, crooked animalcule.' They vary much in external form."

Fig. 64. *The Cuckoo Kolpoda, or common Bosom animalcule.*—"Its general contour has some resemblance to a bean; and if we suppose the two convex lobes or the front side equal, and do not perceive the proboscis, which indeed is seen with difficulty, we shall distinguish some likeness to the bosom; from which similitude it has received its name. The mouth, which is lighter tinted than the surrounding parts, is situated in the hollow between the upper lobe and the proboscis, and marked by a cross, while the termination of the alimentary canal is in the cavity immediately below the proboscis. The margin of the two lobes is furnished with a row of delicate cilia, only observable under favourable illumination. These cilia, by producing a current in the water towards the mouth, perform the same important office as members in some of the mammalia; as the current brings all the particles of matter in the water to the mouth in regular succession." "By feeding them on vegetable colouring matter, the polygastric form of their digestive organs is readily distinguished." "Length of full grown specimens, 1-280th of an inch. They are found in various vegetable infusions, and especially in those of hay which have been kept a considerable time."

Gonium.—"The animalcules of this genus are in clusters; they are propagated by several incisions across the body of the parent, dividing it into a number of symmetrical forms. When observed singly, most of the species resemble the volvox. The structure of their digestive organs is not known. Müller defines this genus as composed of 'invisible, simple, smooth, angular animalcules.'"

Fig. 69. *The Breast-plate Gonium.*—"It consists of sixteen spherical bodies, disposed regularly in a quadrangular form, like the jewels in the breast-plate of the Jewish high priest. They are all arranged in the same plane; the four centre ones are generally larger than those which surround them; and the diameters of the three smaller balls are only equal to the two larger centre ones to which they are attached; the external corners are consequently vacant." "The diameters of the clusters vary from 1-350th to 1-200th of an inch." "They are found near the surface of clear water, and often along with the *Cercaria viridis.* A magnifying power of 200 is sufficient for their examination."

Bursaria.—"'A simple, hollow, membraneous animalcule,' which takes its name from its bag or purse-like form. Ehrenberg has only noticed one species, and has not decided as to the situation of the genus."

Fig. 60. *The little swallow-like Bursaria.*—"The form of this animalcule, by a little effort of imagination, may be compared to a bird, and its movements appear like the flight of the swallow: hence its name." "It is found in stagnant water.

Cercaria.—"An 'invisible, pellucid animalcule, with a tail.' If we consider the internal organization of this genus, it comprehends a very wide range; indeed, the different species vary so much that it is difficult to give a general definition of their characters with any degree of accuracy."

Fig. 59. *The Green Cercaria.*—"This is a highly interesting creature: the bright green colour of its body; its diaphanous extremities; its well-defined orange brown eye; and the numerous transformations of its form, render it a very entertaining object for the microscope; in addition to which it is easily procured, and managed with great facility." "The length of the specimens which I have examined was about 1-350th of an inch: Ehrenberg gives 1-280th as their length." "The magnifying power best adapted for viewing them, is from 300 to 500 times, in an achromatic."

Leucophrys.—"Diaphanous, ciliated animalcules."

Fig. 54. *The bracelet Leucophrys.*—This animalcule is shown in the figure with a portion of the inner edge ciliated.

Trichoda.—"Diaphanous, partially ciliated animalcules."

Fig. 55. *Trichoda vulgaris.*—"Whose crustaceous covering is the shape of a cup, at the circumference of which radiate several strong spines."

Kerona.—"Animalcules furnished with hooks *(uncini)*, bristles *(setæ)*, or horn-like processes."

Fig. 56. *Kerona pullaster.*—"The fore part, in addition to the cilia, is stated to have three setæ. The cilia at the opposite extremity, are often separated; at other times they are collected in a cluster."

Himantopus.—"Pellucid animalcules, with a cluster or tuft of hair."

Fig. 58. *Himantopus larva.*—"This is a very lively creature, swimming and turning in the water in a graceful and diverting manner, inflecting itself, as shown in the figure; the body gradually decreases towards the posterior, and at intervals several hairs appear disposed along it. The margin is fringed."

Vorticella.—"They vary much in their organization; hence I have formed them into two divisions. They are naked, contractile, and possess cilia, circularly disposed near the mouth, producing a vortex in the water; in many of them they appear to rotate like a wheel."

First Division,—Polygastrica. Including the animalcules which possess a number of digestive sacs or stomachs.

Second Division,—Rotatoria. The highest class of infusorial animalcules, so named from their rotatory motion.

Fig. 57. *Vorticella cyathini.*—"This animalcule is shown swimming freely; the edge of the bell is ciliated, though not exhibited in the sketch: it can attach itself by the stem, which it contracts spirally."

Brachionus.—"This genus is composed of animalcules enclosed within, or partially covered by, a shell-like coat. They possess rotatory organs, like the vorticella, and form, in Ehrenberg's arrangements, a parallel order."

Fig. 53. *Brachionus passus.*—"A curious little creature, with two long bristles in front, like the antennæ of an insect."

It is proper to notice here, that our space did not allow us in many instances to transcribe the whole of Mr Pritchard's descriptions, but only so much as was absolutely necessary to convey general information on the subjects illustrated. Though, indeed, we rather owe an apology to the author for taking so much of his admirable performance, than an explanation to our readers for taking so little.

We have now completed the design which we proposed to ourselves in the opening of this article. That we have added something considerable to the *popular* knowledge concerning the microscope and the wonders it reveals, may, we think, without vanity, be assumed; for with the aids and appliances so courteously presented for our assistance, we could scarcely fail to communicate much interesting information on the subject. It does not perhaps fall within our province to moralize on the theme of this essay, otherwise it would be easy to show that there is something connected with microscopic research infinitely more important than the gratification of an abstract curiosity regarding the minute world. It will be neither tedious nor out of place, however, to observe, that the formations and phenomena revealed by the microscope, present a phalanx of arguments asserting the being and unceasing providence of a God; whilst they create a deep conviction in the heart of the observer, (which no latent infidelity can effectually stifle or destroy,) that human reason is totally inadequate to *comprehend* Deity from observation of His works, and that nothing short of the Volume of Revealed Truth is able to bring mankind to a satisfactory knowledge of the Creator.

On the subject of the Microscope, and Microscopic Discovery, we refer, *inter alia*, to *Hooke's Micrographia*, *Swammerdam's Hist. Gen. des Insectes*, *Power's Observations*, *Leeuwenhoeck's Arcana Naturæ*, *Baker's Microscope made Easy*, *Derham's Physico-Theology*, *Newton's Optics*, *Martin's Philosophia Britannica*, *Sir D. Brewster's Treatise on the Microscope*, *Coddington's Optical Treatises*, *Müller's Animalia Infusoria*, *Ehrenberg's Papers in the Transactions of the Royal Academy of Berlin*, *Pritchard's Natural History of Animalcules*, *Goring and Pritchard's Micrographia, and Microscopic Cabinet*, *Pritchard's Microscopic Illustrations*, New and Enlarged Edition, *Pritchard's List of* 2000 *Microscopic Objects*, &c. &c.

MILDERT, WILLIAM VAN, lord bishop of Durham, was the grandson of an Amsterdam merchant, and born in London, in 1765. He received his education at Merchant-Taylors' school, and at Queen's College, Oxford, where he graduated B.A. 1787, M.A. 1790, B. and D.D. 1813. In Trinity term, 1788, he was ordained deacon, on the curacy of Sherbourn and Lewknor, in Oxfordshire. He afterwards became curate of Witham, in Essex; and during his residence at that place he married Jane, daughter of the late general Douglas, who survives him without issue. In April, 1795, he was presented by his cousin german and brother-in-law, Cornelius Ives, Esq., to the rectory of Bradden, in Northamptonshire, from which he was removed, at the close of 1796, to the rectory of St Mary-le-bow, in the city of London. Between the years 1802 and 1805, he preached the lecture founded by the Right Hon. R. Boyle, and discharged that duty with such eminent ability as to attract the general attention of learned men. He soon received a token of public approbation in the vicarage of Farningham, Kent, which was conferred upon him in the most flattering manner by archbishop Sutton. His character, as a preacher and divine, was now fully established; and in April, 1812, he was elected by a large majority of the benchers to the preachership of Lincoln's Inn. In September, 1813, he was appointed by lord Liverpool to be Regius Professor of Divinity at Oxford. In Lent and Easter terms, 1814, Dr Van Mildert preached the Bampton Lecture, to which he had been appointed by the heads of houses before he became professor. In March, 1819, he was made bishop of Llandaff, and dean of St Paul's in the following year. He then resigned his station at Oxford, and divided his time between London and Llandaff. In March, 1826, on the death of Dr Shute Barrington, he was placed in the episcopal chair of Durham. He died on the 21st Feb. 1836. His publications consist of his "Boyle's Lectures," his "Bampton's Lectures," and two volumes of sermons preached at Lincoln's Inn. He also edited the works of Dr Waterland published at Oxford in 1823, to which he prefixed a life of the author.

MILK (*a*). The subject of the adulteration of milk has been investigated with great care, by M. Barruel of Paris. Although his observations are intended to apply only to the milk of that city, yet there is little doubt that they will also be found applicable in a greater or less degree to all great towns. He sets out with stating that all instruments for ascertaining the purity of milk, which are calculated to attain this end by pointing out differences in its density or specific gravity, are inaccurate and useless. For, on the one hand, pure milk differs much in density according to the fodder used by the dairy-man for his cows, the butyraceous matter, which imparts lowness of density, being made to preponderate by some sorts of food, and the caseous part, which increases the density, being made preponderate by other sorts. And, on the other hand, although water, the ordinary substance with which milk is adulterated by the dealers in the French capital, would alone cause a great diminution of density, the dealers know very well how to prevent that effect, and so render the areometer useless. For this purpose, it is only necessary to dissolve in the milk a little sugar-candy, which is required at all events in order to correct the flat taste imparted to milk by diluting it with water. The result of M. Barruel's inquiries on the adulteration of milk in Paris, is that no positively noxious substance is ever to be found in it; that a common practice is to remove a considerable portion of the cream, by allowing the milk to stand for a limited time, and then to dilute the remainder, or skimmed milk, with water, and to give it the apparent qualities of new milk in one or other of the manners now to be mentioned. The opacity of the milk being much diminished by the water, so that the milk acquired a bluish appearance, it was at one time usual to correct this defect, by previously mixing wheat-flour with the water with which the milk was diluted. But this adulteration was too obvious to the senses. Any person even of indifferent delicacy of palate, could detect the altered taste of the milk; and besides, after two hours' rest, the flour sank to the bottom, restoring the translucent blueness of the milk, and pointing out the nature of the fraud. To prevent this inconvenience, the dealers boiled the flour in the water before mixing it with milk; and in this way an opaque mixture was procured, which retained its opacity on standing. As even with this addition the fabricated liquid had a flat taste, sugar or sugar-candy was dissolved in it, by which means the peculiar sweetness of the milk was partly restored. This adulteration, however, has become so easy of detection by means of iodine, which renders the mixture blue by its action on the fecula of the flour, that M. Barruel believes that the fraud now described is very little practised in the present day at Paris. In Britain, where the municipalities take no charge whatever of the purity of this most important article of food, it may be presumed that the adulteration with flower, sugar, and water is common enough, as it is a simple and cheap mode of accomplishing every purpose of the fraudulent dealer. The best mode of proving the presence of farinaceous matter in such mixture, is to heat the milk with a little sulphuric acid, to coagulate the casein, to filter the whey, and then to add to the latter the tincture of iodine; upon which a fine blue colour will be struck. Driven from this species of adulteration, the Parisian dealers have latterly resorted to another so ingenious, that M. Barruel conceives they could not have discovered it without the aid of some scientific person. The method is simple; so cheap, that for tenpence the opacity and colour of milk may be imparted to thirty English pints of water, and so far secret that no disagreeable taste is communicated. This is nothing more than the employment of an emulsion of almonds, for which some dealers, more greedy and less cautious than the rest, have substituted hemp-seed, which, however, is apt to impart an acrid taste. By either of these means the milk may be diluted to an indefinite extent; and the only corrective required is a little sugar-candy to remove the flat taste. A peculiar advantage possessed by this mode of adulteration over every other, is, that the vegeto-animal matter, or vegetable albumen of the emulsion by which the oil of almond is held in suspension, is coagulated, or curdled, like casein, by acids. The method recommended by M. Barruel for detecting the fraud is founded on two circumstances,—the greatly inferior quantity of coagulum formed by acids in the mixture of milk and almond emulsion, compared with that formed in milk alone, and the facility with which, by kneading the coagulum with the fingers, oil may be squeezed out of the former, while none exists in the latter. On examining carefully four different specimens of pure milk, procured from different quarters in Paris, he found that 300 parts of each coagulated by heating them with an equal volume of vinegar, gave each a quantity of curd, which, when well drained, and equally pressed between folds of bibulous paper, weighed 29 parts; and that the same quantity of milk taken from a cow in presence of a person sent to procure it, gave 30 parts of curd. He then found, that when the same milk was mixed with various proportions of water, the quantity of curd was exactly in the inverse ratio of the proportion of water added. The water, therefore, did not prevent any portion of the curd from being thrown down by the usual modes of curdling the milk. He next found, that, if a given quantity of sugar was added to the mixture of milk and water, the quantity added could be separated exactly by evaporating the whey to the consistence of an extract, heating this with alcohol, filtering the alcoholic solution, and evaporating to dryness. He then also found that, when equal parts of almond emulsion and milk were mixed together, 300 parts of the mixture, curdled by vinegar as above, gave 16½ parts of curd; and that the same quantity of a mixture containing two parts of emulsion to one of milk, gave only 10¼th parts of curd. So that although, as was to be expected, the adulteration with almond emulsion did not lessen the quantity of curd to the same extent as adulteration with water only, yet the decrease was very great, and very nearly in the ratio of the quantity of emulsion added. Lastly, on placing pure curd on white paper, no oily matter was thrown out; but the curd procured from the mixture of milk and almond emulsion, besides being less firm than the former, gave out in twenty-four or forty-eight hours a quantity of oil sufficient to stain the paper. Another adulteration to which milk is subjected in Paris, is with carbonate of potass or soda. The object of this variety of adulteration is, in the hot summer months, to prevent the milk from becoming sour and curdling, or to break down the curd and correct acescency when the milk has actually become spoiled. In this process, acetate of potass or soda is formed. Neither of these salts, in moderate quantity, is injurious to the health; indeed, acetate of potass exists naturally in milk, and is the source of some embarassment in the detection of the present fraud. The mode of analysis adopted by M. Barruel is as follows: As the alkaline acetates are converted by incineration into carbonates, he endeavoured, by means of this property, to ascertain the quantity of alkali naturally contained in whey. He therefore evaporated a certain quantity of whey to dryness, incinerated the residue in a platinum crucible, and procured an alkaline ley from the remainder, which, by the process recommended by Decroisil for measuring the strength of alkaline fluids, indicated from one and a half to two degrees of alkalinity. Hence any increase of alkaline strength above the last of these points, must be considered as owing to the intentional addition of carbonate of potass or soda. This is evidently the most difficult of the processes recommended for detecting the various adulterations specified in M. Barruel's paper. Indeed, a chemist alone could conduct it. The others may be easily executed by any body.

MILL, James; author of the History of British India, and other works, was born in the parish of Logie Pert, Forfarshire, on the 6th April, 1773. He received the early part of his education at the grammar school of Montrose, and was afterwards, through the patronage of Sir John Stuart, Bart, of Fettercairn, on whose estate his father held a small farm, sent to the university of Edinburgh, where he was educated for the church. In 1800, he accompanied Sir John Stuart to London, where he settled, and supported himself entirely by his pen. For several years, he was a contributor to the Edinburgh Review, the British, the Eclectic, and Monthly Reviews. He was also the editor for some time of the Literary Journal, and contributed largely to the Philanthropist, a Quaker periodical. His History of British India was commenced about 1806, and occupied a large portion of his time for a period of ten years. It was published in the winter of 1817—18 in 5 vols. 8vo., and was the first history calculated to convey complete and sound views of India and Anglo-Indian affairs. The knowledge of the subject which the author displayed induced the East India Court of Directors (much to their honour, for he had freely censured many of their transactions) to intrust to him, in 1819, the chief conduct of their correspondence with India in the revenue branch of administration. He afterwards rose to be head of the department in the India House of correspondence with India, or, in other words, chief minister for Indian affairs to the East India company. His official duties, however, did not prevent him from continuing to exercise his pen. He contributed a number of valuable articles to the Supplement to the Encyclopedia Britannica, which were afterwards collected and printed in a separate form. The subjects of the principal of these were on Government, Education, Jurisprudence, Law of Nations, Liberty of the Press, Colonies, and Prison Discipline. In 1821—22, he published his Elements of Political Economy, which professed no higher object than furnishing a clear summary of the leading doctrines of that science. In 1829 he published his Analysis of the Phenomena of the Human Mind, a work upon which he had bestowed extraordinary labour, and at which he evinced great analytical powers. His last work was published in 1835, anonymously, entitled a Fragment on Mackintosh. In this work he criticises Sir James Mackintosh's Dissertation on the History of Ethical Philosophy with great and uncalled for severity. Mr Mill belonged to the Radical party in politics, and wrote many of the principal articles in the Westminster Review. The celebrated articles on the Formation of Opinions in No. XI., and on the Ballot in No. XXV., were by him. He died of consumption on the 23d of June, 1836, and was buried at Kensington, where he had spent the last five years of his life. He left a widow and nine children. In private, he was highly esteemed. His conversation was eloquent and impressive. He was a stranger to selfishness. Young men were particularly fond of his society; and it was always to him a source of great delight to have an opportunity of contributing to form their minds and exalt their character.

MIOCENE PERIOD, in geology, means the next to the oldest division of the tertiary strata. It is so called from *μειων*, smaller, *καινος*, recent, because a small minority only of fossil-shells are found imbedded in its formations. Of 1021 shells of this division, only 176 were found to be of recent species, or 18 per cent. The miocene strata are found in Touraine, and in the south of France near Bordeaux, in Piedmont, and in the basin of Vienna and other localities.

MONTGOMERYSHIRE; an inland county of North Wales, of an irregular form, varying in length from twenty-three to forty miles, and in breadth from nineteen to thirty-three miles. Its area is estimated at 839 square miles. It possesses great variety of character both in surface and soil. The course of the Severn, through the south eastern angle of the county, is marked by a vein of fertile and highly cultivated land. To the west and north, the surface ascends until it reaches the borders of Merioneth in the Berwyn range, which attain a height of 2037 feet; and to the south-west, on the borders of Cardigan, in the mountain of Plinlimmon, an elevation of 2463 feet above the level of the ocean. The Breddin hills form a striking feature in the general view of the eastern district, and the table-land, occupying so much of the central regions, averages 1000 feet in height above the sea. These hills and highlands are much less picturesque than the Merioneth and Caernarvon mountains, but infinitely more productive, being clad with verdure to their summits. The range which issues northward from Plinlimmon, is called the Backbone of Montgomery, and here originate the principal rivers of the county. The rivers which run westerly from the mountain ridges are the Traeth-back, the Maw, and the Dovey; those which run eastward are the Wye, the Severn, the Vyrnwy, and the Tanat, besides minor streams. The Severn and the Dovey are the only navigable rivers in the county. A navigable canal, commenced in 1794, connects the Severn at Newtown with a branch of the Ellesmere canal in Shropshire. Its length is twenty-seven miles. Montgomeryshire is very scantily supplied with coal and limestone. Its principal minerals are copper and lead ore. A rich lead mine at Talessi formerly yielded large profits to its owner, Sir Watkins Williams Wynne, but the working has been discontinued owing to the flooding of water. The agriculture of the county is in a backward state: corn and hemp are the principal articles grown. A considerable portion of the land is devoted to pasturage. The county is well wooded, and the oaks of Montgomery are in high estimation for our dock-yards. The chief manufactures are those of woollens, made from the fleeces of native sheep, and consisting mostly of flannels. Farmers and cottagers make these flannels, and they are collected by a sort of middlemen, who bring them to the market at Welshpool, whence they are distributed throughout the kingdom under the name of Welsh flannels. The borough and market-towns of Montgomeryshire are, Montgomery (population of parish, 1188); Machynlleth (population, 2381); Newtown, (population, 4550); Welshpool (population, 4533); Llanedloes (population, 4189); Llanfyllen (population, 1836); and Llanfair (population, 2687.) The county-jail and house of correction are at Montgomery, where the quarter sessions are held. The assizes are held in the spring at Welshpool; in the winter at Newtown. The county returns one member to parliament; the boroughs another. Population of the county in 1831, 66,482.

MONTROSE; (called provincially *Monross*, supposed from the Gaelic *Moinh*, back, and *Ross*, promontory,) an ancient royal burgh and seaport town of Scotland, in the county of Forfar, distant from Edinburgh seventy and from Dundee thirty miles north-east. It is situated on a peninsula formed by the German ocean on the east, the South Esk river on the south, and by a large expanse of this river, called the Basin of Montrose, on the west. The basin is nearly dry at Low water, but during high water it presents the appearance of a vast lake, surrounded by numerous country seats, and finely cultivated fields, and forming altogether a very attractive scene. The town is well built, and consists chiefly of one spacious main street, from which smaller streets diverge. Among the public edifices are, the town-house, a neat building, with an arcade below, and rooms for public business over it; the old parish church, to which a tower, surmounted by a spire, was attached in 1835, said to form the highest steeple in Scotland; St John's church, made a parish church in 1835; St Peter's Episcopal chapel in the Links, founded in 1722; the Lunatic asylum, erected in 1780, and considered one of the best institutions of the kind in Scotland; the Academy, erected in 1814; a spacious seminary erected in 1832, and a commodious new-jail erected in 1833. In 1828–9, a magnificent suspension-bridge, 432 feet in length, was thrown across the South Esk, designed by captain Samuel Brown, R. N., and finished at an expense of £20,000. The harbour on the east side of the bridge is commodious, and furnished with good quays. It is a port of the custom-house, and includes the havens and creeks from Bervie Brow to the Tay. Two light-houses, with fixed lights, were erected on the north side of the river in 1818, by which vessels are enabled at night to make the harbour with safety. The number of vessels belonging to the port amounted in 1837 to 105, registering about 11,050 tons. Most of these are engaged in the importation of flax from the Baltic, and a number in bringing coal from Newcastle and Sunderland. The export trade consists chiefly of grain, cured salmon, herring, and cod. The manufactured goods are sent coastwise to London, Glasgow, Dundee, &c. A large steamer now sails regularly between Montrose and London. The principal manufactories of the town are those of sail-cloth, sheeting, and linen, with which are connected several flax spinning-mills. Ship-building is carried on to some extent. Montrose abounds in benevolent and charitable institutions, and in associations for religious, literary and scientific purposes. Between the town and the sea, there are extensive links or downs, where the game of golf is played, and where horse races used occasionally to take place. A small neat theatre, opened for the amusement of the inhabitants, has been of late years converted into dwelling houses. The town is lighted with gas, and abundantly supplied with water, brought in pipes from a distance of three miles. Montrose unites with Forfar, Brechin, Arbroath, and Bervie, in sending a member to parliament. The population of the *parish* of Montrose, which extends about three miles on either side, was in 1831, 12,055; and in 1841, 15,096 James Graham, the celebrated marquis of Montrose, was born in the burgh in 1612. Andrew Melville, the father of Presbytery in Scotland, was born in the neighbourhood, and received the early part of his education at Montrose.

MORGAN, William, F. R. S., actuary of the society for equitable assurances on lives and survivorships, was born at Bridgend, in Glamorganshire, on the 6th of June, 1750; and educated for his father's profession, which was that of medicine. By the kind assistance of his maternal uncle, Dr Price, he was enabled to enter as a student at Guy's and St Thomas's hospitals. There he continued for three or four years, pursuing his medical studies with great zeal, industry, and success. In 1770, Dr Price published the first edition of his work on "Reversionary Payments, on Schemes for providing Annuities for Widows and for Persons in Old Age, and on the method of calculating the Value of Assurances on Lives." This caused Dr Price to be consulted by many societies instituted for these purposes, as well as in cases for the valuation of individual reversionary interests; and he suggested to his nephew, that it might possibly be of advantage to him to turn his attention to these subjects. He accordingly commenced the study of mathematics about this time (1772), and made an extraordinary and rapid progress in them. In February, 1774, he was, at the recommendation of Dr Price, appointed to the office of assistant actuary to the equitable society; and succeeded to the more important office of actuary, in February, 1775, the president and directors of which society had frequently consulted Dr Price on the management of their affairs. Here he had an opportunity of following the peculiar bent of his genius, and he pursued his mathematical studies with great ardour and an enthusiastic love of science. In the year 1779, he published the first edition of his work on the Doctrine of Annuities and reversionary Payments, containing rules for solving all questions concerning the value of annuities and reversions depending on any one, two or three lives, or on any survivorships among them, most of which had never before been answered. These solutions were all derived from the hypothesis of De Moivre. In 1781, he published an Examination of Dr Crawford's Theory of Heat and Combustion (the first edition). In 1788, he communicated, through Dr Price, his first paper to the royal society, namely, on the Probabilities of Survivorships between two Persons of any given age, and the method of determining the Value of Reversions depending on those Survivorships (from tables of the real probabilities of life: this had never been done before). For this paper the president and council adjudged to him the gold medal on Sir Godfrey Copley's donation, and he was shortly afterwards elected a Fellow. In 1783, he communicated a paper on the Method of determining, from the REAL Probabilities of Life, the Value of a Contingent Reversion in which *three Lives* are involved in the Survivorship. In 1791, another paper on the same subject. In 1794, a further investigation of the same. These papers comprised the solution of seventeen different problems; and, in 1799, he communicated the solution of seven more problems in which three lives are involved, in all of which were also involved a contingency never before accurately determined, *namely*, that of one life failing after another in a given time. These problems may be said to have exhausted the subject so far as it relates to contingencies on three lives. The whole of these papers he afterwards revised and republished in the second edition of his work on the Doctrine of Annuities, 1821. He also communicated to the royal society a paper on the Non-conducting power of a Vacuum. He also published the following pamphlets:—In 1792, "A Review of Dr Price's Writings on the Subjects of the Finances," &c. In 1796, "Facts addressed to the serious Attention of the People of Great Britain," followed by "Additional Facts." In 1797, "An appeal to the People of Great Britain on the alarming State of the Public Finances." In 1803, "A Comparative View of the Public Finances from the beginning to the close of the late Administration." In Rees's Cyclopædia, he wrote on Life Annuities, Chance, Funds, Interest.

Mr Morgan's services, in connection with the Equitable Society, were of great public importance and utility. The Equitable Society was founded in 1762, and although, in some respects, it proceeded on more scientific principles than any society which had been previously established, possessed but little claim to its title. Mr Morgan was the first to give a perspicuous explanation of the general principles of life assurance. By his ability, integrity, and wisdom he guided this institution from one step of prosperity to another, and raised it from comparative insignificance, consisting, at the time of his appointment, in 1774, of about 700 members, with a capital of only £33,800 stock in the three per cents., under regulations which must ever have retained it in a state of infancy and weakness, to its present magnitude and importance, consisting of many thousand members, and possessed, in 1829, of a capital exceeding £9,000,000, an income of nearly £800,000 per annum, and engaged in assurances for the most part intended as a provision for the surviving families of its members, to the amount of upwards of £19,000,000.

Mr Morgan's decease took place at Stamford Hill, Middlesex, on the 4th of May, 1833, in the eighty-third year of his age. He was a protestant dissenter of the Unitarian school.

MORPETH; a town of Northumberland, situated by the river Wansbeck on the line of the great road from Edinburgh to London, about fourteen miles north of Newcastle-upon-Tyne. The town is of remote antiquity, and consists principally of two streets, in the centre of which is the market-place. The new county gaol, house of correction, court-house, &c., is a fine pile of buildings, erected in 1829, on the south side of the river. The town-house was erected in 1714, at the expense of the earl of Carlisle, in which the manorial court is held, as well as the quarter sessions for the county; it is built of hewn stone, having a piazza ornamented with rustic work, and the superstructure decorated with turrets. The ruins of the ancient castle of Morpeth are situated on an eminence, and consist only of some fragments of the outer wall, and part of the gateway tower; at a short distance from this tower is a round mound of earth, raised to a considerable height, probably for the purpose of blockading the fort, which appears to have been of great strength. The largest cattle-market in the north of England is held here weekly, and the whole of the counties of Northumberland and Durham are supplied with cattle from it. By far the larger portion of the cattle sold here are brought from the southern districts of Scotland. Hodgson, the historian of Northumberland, says, "The privilege of holding a weekly market here on Wednesday was first granted to Roger de Merlay the second, by king John, in 1199. The great cattle-market holden here weekly on that day, probably grew, with the trade on the Tyne and Wear, from very small beginnings to its present consequence. Three persons were fined at the Manor court, at Easter, 1656, for having sheep-pens considerably before their doors." From the 13th of February, 1832 (when the new bridge built across the river Wansbeck, at the southern approach to the town of Morpeth, was opened,) to the 10th of February, 1833, the gross number which passed along the bridge (at which a toll is taken) was 19,887 oxen, and 189,091 sheep, &c.; but although by far the greatest number of the cattle sold here pass along this bridge, this gives but an imperfect idea of the actual number sold, and does not include those which go in other directions. The market is held on Wednesday, and the number of persons in the habit of attending it is very great, and composed for the most part of butchers, farmers, cattle graziers, and jobbers, or cattle-dealers. Towards ten o'clock, on the Tuesday evening, the preparations for the ensuing day's market begin by persons setting up the sheep-pens; and at the earliest break of the following day the market commences. The scene of confusion which the town presents on the mornings of Wednesday can scarcely be imagined. The narrow street in which the market is principally held is lined on either side with sheep-pens; and the intermediate space is crowded with carts, cattle, carriages, and all manner of persons. Morpeth formerly returned two members to parliament: by the reform bill, it returns only one. Population in 1841; of the town, 3441; of the parish, which includes seven other townships, 4237.

MORRISON, Robert, D.D., F.R.S., M.R.A.S., an eminent Chinese scholar and missionary, was born at Morpeth, 5th Jan. 1782. His father, a last and boot-tree maker, was a native of Perthshire, and he himself was brought up in the Presbyterian persuasion. In 1803, he was received as a student or probationer into the dissenting academy at Hoxton. There he continued till May 28th, 1804, when he was accepted as a missionary, and was received under the patronage of the London Missionary Society, who sent him to their seminary at Gosport, to be educated for that service, under the superintendence of the Rev. David Bogue. He returned to London in the summer of 1806; and, having chosen China as the field of his missionary labours, he, the better to qualify himself for them, obtained the assistance as a preceptor, of a young Chinese, named Yong-Sam Tae, by whose assistance, and with the practice he acquired in forming the Chinese character by transcribing a Chinese MS. of the four Gospels in the British Museum, and another the property of the royal society, he made considerable progress in qualifying himself for his undertaking. On the 8th of January, 1807, he was formally set apart, or ordained, according to the practice of the church of Scotland, in the Scottish church in Swallow Street, to the work of a Christian missionary among the Chinese; and on the 31st he embarked for China, *via* America, and landed at Macao on the 4th of September, 1807. On his arrival at that place, he continued to prosecute the study of the Chinese language. In 1808, he was appointed translator to the East India Company's factory at Canton, and about the close of the year he informed the Missionary Society that he had completed a grammar of the Chinese language; that his dictionary of the same language was daily filling up, and that his MS. of the New Testament was in part fit to be printed. In 1813, he completed an edition in Chinese of the whole of the New Testament, of which he forwarded a few copies to Europe as presents to his friends. Large impressions of this Testament have since been printed: they bear date in the years 1815, 1819, 1822, and 1827, and were extensively circulated in China. He at the same time wrote and printed a Catechism in Chinese, with a tract on the Doctrines of Christianity, of which 15,000 copies were printed and circulated. In 1815, he commenced the publication of his Dictionary of the Chinese Language. This work was printed at a press established expressly for that purpose at Macao. It consists of three parts:—the first part containing the Chinese and English, arranged according to the radicals, fills three quarto volumes of about 900 pages each, bearing date 1815, 1822, and 1823. It was by this systematical arrangement of the elements of the Chinese language that Morrison surmounted a difficulty, which had till then been found insuperable by Europeans, in their endeavours to understand the speech and writings of the natives of this immense empire. The second part, which fills two volumes, published in the years 1819 and 1820, contains the Chinese and English arranged alphabetically; the third part, published in the year 1822, consists of English words with Chinese meanings. The Dictionary was completed on the 15th of April, 1822. The cost, which amounted to £15,000, was defrayed by the East India Company. After he had completed his translation of the New Testament, in 1813, he obtained the co-operation of the Rev. Mr Milne, who had been sent to Malacca by the London Missionary Society, in charge of their missionary establishment at that place. With Mr Milne, whose life fell a sacrifice to the climate in the year 1822, Dr Morrison maintained a constant and cordial friendship, and with his assistance he completed a Chinese version of the books of the Old Testament on the 25th of November, 1819. The portion of this work which was translated by Dr Milne consists of the book of Deuteronomy, and later historical books, and the book of Job. The translation and publication of the whole of the Old and New Testaments, in nineteen volumes octavo, was completed in the year 1819. Leang-a-fă, a native Chinese, who had been converted to the Christian faith by Dr Milne, assisted in passing the work through the press. Other editions of this work have been printed since the year 1819, at the expense of the British and Foreign Bible Society; and Dr Morrison meditated, and, indeed, had undertaken, previous to his decease, a new and revised edition of the Sacred Scriptures in Chinese, under the patronage of the Bible Society. In 1817, he published a "View of China for Philological Purposes," in one volume quarto, containing a sketch of Chinese chronology, geography, government, religion, and customs, designed for the use of persons who study the Chinese language. This volume contains an outline of the Chinese dynasties, with many historical facts, of which more recent writers on China have not failed abundantly to avail themselves. In the same year, his extensive acquaintance with the language and literature of China recommended him as the fittest person to accompany lord Amherst on his embassy to Pekin. Dr Morrison, accordingly, accompanied his lordship as his Chinese interpreter; and wrote a memoir of the embassy, which was afterwards published in this country. On the 24th of December, 1817, the Senatus Academicus of the university of Glasgow unanimously conferred upon him the degree of doctor of divinity, in token of their approbation of his philological labours. In 1818, he executed a project, which he had long had in contemplation—the establishment of an Anglo-Chinese college at Malacca, in which the languages and literature of the two countries should be interchangeably communicated, chiefly with a view to the final object of his mission, the introduction of the Christian religion into China. Towards the foundation of this college he gave £1000 with an endowment of £100 per annum for five years; and obtained the further requisite pecuniary aid from his friends in Europe and Asia. He made other pecuniary grants towards the support of this institution, and was, till his death, its most powerful and efficient patron.

In 1824, he returned to Europe, and was received with marked attention in the several religious, literary, and scientific circles in England and Scotland, in which he made his appearance; and not less so in the French metropolis, where he spent part of the summer of 1825. He had also the honour, during his residence in England, to be enrolled a member of the royal society; and was presented, as one of the most eminent Chinese scholars of the age, by the president of the Board of Control, to the King at his levee, to whom he submitted a complete copy of the Sacred Scriptures in the Chinese language, together with some other productions of the Chinese press. He brought with him to England his Chinese library, consisting of several thousand volumes in every department of Chinese literature. During his residence in England, he published a thin quarto volume entitled the "Chinese Miscellany," consisting of original extracts from Chinese authors, in the native character; with translations and philological remarks. In the publication of this work, he had recourse to lithography,—an art which he subsequently described as peculiarly well adapted to the multiplication of copies of pages written in the Chinese character, and which for that reason he has introduced into China. In 1826 he returned to China, under the auspices of the court of directors of the East India Company. On the arrival of lord Napier at Macao, with his majesty's commission, constituting the new arrangement for the administration of the British affairs in China, he found Dr Morrison there; and, in pursuance of instructions received from our government, appointed him Chinese secretary and interpreter to the commission. Dr Morrison was then, and had been for some time, in declining health; he, nevertheless, consented to accompany his lordship, on his resolving to proceed immediately to Canton, and was with him, in an open boat and in a storm of rain, on the Canton river, in the night between the 24th and 25th of July, 1834. The party did not arrive at Canton till the morning of the 25th. From that time, disease made rapid advances, and he expired in the fifty-third year of his age, on the evening of the 1st of August, in the arms of his eldest son, John Robert Morrison. This gentleman was appointed his father's successor in the duties of his offices. The following is a list of publications by Dr Morrison which have not been already noticed. 1. A Tract, printed in China, in Chinese, entitled A Voyage round the World, illustrative of the Manners and Religious Opinions of Christians. 2. A translation into Chinese of The Morning and Evening Prayers of the English Church; with the Psalter, divided into Portions to be read daily. 3. A translation into Chinese of the two first Homilies of the English Church. 4. Introduction to the reading of the Sacred Scriptures, in Chinese, with Chronological, Historical, and Literary Notices, and a System of Reference to Books, Chapters, and Verses. 5. Epitome of Church History and Prophecy. 6. The Devotional Times, Forms, &c., of the Protestant Church. 7. Aids to Devotion, taken from the English Liturgy. 8. Prayers and Hymns, in Chinese, 1833. 9. A work on the First Epistle of St Peter. 10. Dialogues and Detached Sentences in the Chinese Language; with free and verbal Translations. 11. China; a Dialogue for the Use of Schools. 12. Hints on Missions. 13. Religious Tracts, addressed to Sailors. 14. A Sermon preached at Whampoa, 1833; printed in London. 15. A Volume of Sermons in English.

MURRAY, Alexander; a distinguished linguist, was born at Dunkitterick, in the parish of Minnigaff, stewartry of Kirkcudbright, on the 22d October, 1775. His ancestors for several generations were humble Galloway shepherds. His father's whole property consisted only of two or three scores of sheep, and four muirlands cows. "He had no debts," says his son, "and no money." As all his other sons were shepherds, it was with him a matter of course that Alexander should be brought up to the same employment; and accordingly, as soon as he had strength for any thing, that is, when he was about seven or eight years of age, he was sent to the hills with the sheep. However, from the first he gave no promise of making a good shepherd, and he was often blamed by his father as lazy and useless. The truth is, he was not stout, and was likewise short-sighted, which his father did not know. Besides, "I was sedentary," says he, "indolent, and given to books, and writing on boards with coals." But his father was too poor to send him to school, his attendance upon which, indeed, would have been scarcely practicable, unless he could have been boarded in the village, from which their cottage, situated in a wild and sequestered glen, was five or six miles distant. About this time, however, (in May, 1784,) a brother of his mother's, who had made a little money, came to pay them a visit; and hearing accounts of the genius of his nephew, offered to be at the expense of boarding him for a short time in New Galloway, and keeping him at school there. His attendance at school, however, had scarcely lasted for three months, when he fell into bad health, and he was obliged to return home. For nearly five years after this he was left again to be his own instructor, with no assistance whatever from any one. As soon as he became sufficiently well he was put to his old employment of assisting the rest of the family as a shepherd boy. "I was still," he says, however, "attached to reading, printing of words, and getting by heart ballads, of which I procured several. About this time, and for years after, I spent every sixpence that friends or strangers gave me, on ballads and penny histories. I carried bundles of these in my pockets, and read them when sent to look for cattle on the banks of Loch Greanoch, and on the wild hills in its neighbourhood." And thus passed away about three years of his life. All this time the bible and these ballads seem to have formed almost his only reading; yet even with this scanty library he contrived to acquire among the simple inhabitants of the glen, a reputation for unrivalled erudition. He was now twelve years of age; and as there seemed to be no likelihood that he would ever be able to gain his bread as a shepherd, his parents were probably anxious that he should attempt something in another way to help to maintain himself. Accordingly, in the latter part of the year 1787, he engaged as teacher in the families of two of the neighbouring farmers; for his services in which capacity, throughout the winter, he was remunerated with the sum of sixteen shillings. He had probably, however, his board free in addition to his salary, of which he immediately laid out a part in the purchase of books. In 1790, he attended school during the summer for about three months and a half. It seems to have been about this time that his taste for learning foreign languages first began to develope itself, having been excited, as he tells us, by his study of "Salmon's Geography." The following summer, that of the year 1791, was spent by him still more laboriously than any of the preceding; and the advancement he made is a surprising evidence of what diligence may accomplish. He again attended school for about three months, and, in addition to the tasks of the school, he read with avidity by himself whatever books in English, Latin, or Greek, he could any where borrow. He in fact actually made himself familiar, and that chiefly by his own unassisted exertions, with the French, Latin, Greek, and Hebrew languages, and perused several of the principal authors in all of them, within about a year and a half from the time when they were all entirely unknown to him; for it was at the end of May, 1790, that he commenced the study of French; and all this work had been done by the end of November in the year following. There is not, perhaps, on record a more extraordinary instance of youthful ardour and perseverance. He was again engaged in teaching during the winter, and received, as he states, for his labours about thirty-five or forty shillings. "I devoted," however, he says, "as usual, every spare hour to study. French, Latin, Greek, and Hebrew, occupied all my leisure time." In the summer of 1792, he returned to school for the last time; and remained for about three months and a half. The different periods of his school attendance, added together, make about thirteen months, scattered over the space of nearly eight years. About this time, he made himself acquainted with the Abyssinian alphabet, from an inaccurate copy of it which he found in an odd volume of the Universal History. The Arabic letters he had learned before, from Robertson's Hebrew Grammar.

In 1794, he was induced to visit Edinburgh, and, chiefly through the instrumentality of Mr James Kinnear, printer in the king's printing-office, he was introduced to the late principal Baird. He was examined by the principal and several professors of the university, and so surprised them by the extent and accuracy of his acquaintance with French, Latin, Greek, and Hebrew, that measures were immediately taken for having the classes thrown open to him, and his maintenance secured while attending them. For the next ten or twelve years of his life he resided principally in Edinburgh. During that time, beside passing through the course of education necessary to qualify him for the ministry of the Scottish church, he continued to devote himself with all his old enthusiasm to the study of languages, in which he was so admirably qualified to excel. No man that ever lived, probably, not excepting Sir William Jones himself, prosecuted this branch of learning to such an extent as Murray. By the end of his short life, scarcely one of either the oriental or the northern tongues remained uninvestigated by him, in so far as it was possible to acquire the knowledge of it from sources then accessible in this country. Of the six or seven dialects of the Abyssinian or Ethiopic language in particular, he had made himself certainly much more completely master than any European had ever been before; and this led to his being selected by the booksellers in 1802 to prepare a new edition of Bruce's Travels, which appeared in seven volumes octavo three years after, and at once placed him in the first rank of the oriental scholars of the age. In 1806 he left Edinburgh, in order to officiate as clergyman in the parish of Urr in Dumfriesshire. And here he remained pursuing his favourite studies for six years. In 1812 the professorship of oriental languages in the university of Edinburgh became vacant; and Mr Murray's friends immediately seized the opportunity of endeavouring to obtain for him the situation of all others which he seemed especially formed and endowed to fill. A multitude of testimonials of his qualifications for the vacant chair, were published, as honourable as ever were given to any candidate, whether we look to the decided terms in which they were expressed, or to the authority of the writers. One was from the late Mr Salt, one of the most distinguished of modern orientalists. "My acquaintance with Mr Murray," says he, "originated in my admiration of the deep erudition and extensive research displayed in his edition of Mr Bruce's travels in Abyssinia. Having twice visited that country, I was led to pay particular attention to its history and literature, and in these pursuits I received so much assistance from Mr Murray's labours that I took an early opportunity, on my return to England in February, 1811, from the mission to Abyssinia in which I had been engaged, to recommend him to the marquis Wellesley *as the only person in the British dominions*, in my opinion, adequate to translate an Ethiopic letter which I had brought from Ras Willida Selasé, addressed to the king. My recommendation was attended to, and Mr Murray finished the translation in the most satisfactory way."* He was elected on the 8th of July by a majority of two votes; and a few days after, the senate of the university unanimously passed a vote of thanks to Dr Baird for bringing his pretensions before the patrons, conferring, at the same time, the degree of doctor of divinity upon their new associate. But all these honours came only to make the setting of the luminary more bright. On the 31st of October, Dr Murray entered upon the discharge of his public duties, in a weak state of health, but with an ardour in which a.. weakness was forgotten. Although declining in strength every day, he continued to teach his classes during the winter, persevering in the preparation and delivery of a course of most learned lectures on oriental literature, which were attended by crowded and admiring audiences; and even carrying an elementary work through the press for the use of his students. A new impression of his edition of Bruce's Travels also appeared in the beginning of February. Engaged in these labours, he could not be persuaded that he was so ill as he really was; and when Mrs Murray, who had been left behind him at Urr, urged him to permit her to come to town, it was with difficulty that he was at last brought to consent to her joining him on the 16th of April. Fortunately, her affection and her fears impelled her to set out on her journey a few days earlier than the appointed time, and she arrived in Edinburgh on the 13th. She found her husband surrounded by his books and papers, and even engaged in dictating to an amanuensis. But life was now ebbing rapidly. He retired that evening to the bed from which he never rose; and before the close of another day he was among the dead. He died on the 15th April, 1813, in his thirty-eighth year, If he had lived longer, he would probably have reared for himself many trophies, and extended the bounds of human learning. His ambition had always been to perform in the field to which he more especially dedicated his powers, something worthy of remembrance; and his latter years had been given to the composition of a work—(his History of European Languages) — which, if time had been allowed to finish it, would unquestionably have formed a splendid monument of his ingenuity and learning. It was published after his death, in so far as it could be recovered from his manuscripts, (1823, 2 vols. 8vo) under the auspices of Sir Henry Moncrieff and Dr Scot of Corstorphine; and although, probably, very far from what it would have been had he lived to arrange and complete it, is still a wonderful display of erudition, and an important contribution to philological literature.

MUSIC, (*a*.) The earliest music on record is the song of Moses and the Israelites after the passage of the Red sea, when Miriam took a timbrel in her hand, and answered them. "And all the women went out after her with timbrels and dances." Here it may be observed, that the instrument, whatever it was, that is called *timbrel*, was used merely as an accompaniment to the voice, or, it may be, to the dance. And this is true of nearly all the instrumental music of those times called ancient. It was, for the most part, little more than an accompaniment to the voice, generally following it very exactly in its modulation and its time. Still the power of music could not have been slight or unimportant; for it is not merely, nor principally, by the pleasure it affords the ear, that it produces its effects; but by the natural expression of emotion or passion, thus appealing to and exciting feelings which may be of the most intense energy. Such effects may be produced by music of a simple character, as well as by that of a complicated and scientific kind. Expression can be given to the wild war-hoop of the Indian, as well as to the elaborate composition of the European; and expression never fails to excite a corresponding emotion in the breast of the auditor. In speaking and thinking, therefore, of the strange and astonishing effects ascribed to ancient music, which, after all due allowance for poetic exaggeration, will still remain very great, it should be constantly borne in mind, that these effects are due, not to scientific combinations of sound, but to natural strong expression, which exercises its sympathetic power in proportion to its naturalness, rather than its abstract science. It is, indeed, the aim of all true science in music to give to those studied combinations which please the cultivated musical intellect, that various and true expression which is able to touch the heart of every hearer, whether skilled or not in the charming art. Nothing is so barren, so tedious, so utterly vexatious, as a long, laboured, scientific piece of harmony, in which expression is either wanting or indistinct. It is addressed, not to a mixed audience, but to the scientific composer only, who alone can appreciate the great difficulties conquered, or the immense labour bestowed; and one might as well attempt to please an assembly by a dissertation on the differential calculus, intelligible to the mathematician only, as by such a musical composition.

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* After Dr Murray's death, a pension of £80 a year was bestowed upon his widow by the king, in remembrance of his services on this occasion.

This fact seems to have been lost sight of in the interminable discussions which have taken place respecting the musical attainments of the ancients. It has been inferred from the extraordinary stories which have come down to us of its effects, that it must have been very elaborate, scientific, and skilfully complicated; and, on the other hand, it has been inferred, from the obvious, acknowledged simplicity of the instruments in use, and the seeming imperfection of the ancient scale, with the uncertainty respecting the means of combination of sounds then understood, that all those stories were mere fables, absolute inventions of the fathers of history and poetry. Neither inference is necessary; and if it be recollected that the effect of music does not depend upon its scientific arrangement, so much as on its expressive simplicity, the accounts of its effects, however wonderful, may be easily reconciled with the comparative rudeness of the instruments by the aid of which those effects were produced. It may be remarked, too, that one instrument was then in use, which, there is no reason to doubt, was as perfect as it is at the present moment; capable of producing the same thrilling tones, the same touching cadences, the same variety, strength, and delicacy of expression. That these powers should have lain dormant among people of luxurious tastes and intellectual refinement, is altogether incredible, whatever may have been the artificial divisions of the gamut, or however imperfect the means of recording the tones of the human voice.

There was a long period, however, in the history of the world, when luxury and refinement did not exist; and when, without doubt, music was in the same imperfect and rude state as the other arts of life. It is certain, that no very rich combinations of harmony could have been made by those who were acquainted with no other instrument than the timbrel, just mentioned, and the trumpet. Moses, who had been carefully trained in all the learning of the Egyptians, in which music was deemed worthy to hold a place, caused two silver trumpets to be made "for the calling of the assembly, and for the journeying of the camps;" and no other instrument of music is mentioned throughout the history of the Hebrew legislator. It would be rash to infer that nothing else was known, at this period, to the Egyptians; for the condition of the Israelites scarcely permitted them to give much attention to the superfluities of life, and, though it is impossible to fix the date of their invention, it is well known that several other instruments were in use among the ancient inhabitants of Egypt. The lyre, the pipe, the kettle-drum, and the sistrum are reckoned by Burgh the only instruments of that people; but to these must be added the trumpet and timbrel, as it is scarcely probable that Moses invented them, and an instrument of two strings, somewhat resembling the mandolin in shape and size, described by Dr Burney from a figure on an ancient obelisk. It is known, too, that the learned men of Egypt early made profound mathematical calculations respecting the proportions of sounds, a study implying some acquaintance with the vibrations of musical strings; but, as historians in those days were less careful than writers of a later time to fix the dates of events, it is impossible to speak with the desirable precision of the order of invention of musical instruments, as well as of many other things still more important. All we can do is to observe, that at certain periods progress in the art is perceptible, and the most thorough investigation could lead to nothing more than a conjecture as to the year or even the century of an invention.

From the time of Moses no mention of music is made, in the history of the Hebrews, till the reign of Saul; with the exceptions of the song of Deborah and Barak, which does not appear to have been accompanied by instruments; and the timbrel of the unhappy daughter of Jephthah, who went to meet her more unhappy father "with timbrels and with dances." In the hands of David we first hear of the harp, and in the use which he made of it we find perhaps an early instance of the instrument being played independently, and not simply as an accompaniment to the voice and the poetry, which seem to have constituted a principal part of the charm of ancient music. We find, too, a striking resemblance in the effect produced by the minstrelsy of the Hebrew shepherd boy, and that of our own contemporary music; a resemblance which shows, that, if the human heart had the same feelings and affections then as now, the music which produces like effects cannot be very dissimilar in its character. "And it came to pass, when the evil spirit from God was upon Saul, that David took an harp, and played with his hand: so Saul was refreshed, and was well, and the evil spirit departed from him." How many a melancholy spirit has been cheered, how many a sorrowing heart has been soothed by the irresistible charm of music in later days. And it has often occurred to us that the moody gloom, which, like Saul's, amounts almost to madness, might be chased from the soul, and greatly alleviated, if not wholly cured, by the skill of the "cunning player," or the voice "of the well-instructed in song."

The musical taste and talent of David were not unemployed during his whole reign. He composed, and encouraged others to compose those Psalms, which from the day they were written have been held in the highest esteem, as the most beautiful specimens of devotional poetry existing in the literature of any people. The poets of antiquity were always musicians, and there is no reason to doubt that David himself prepared the music as well as the verse of his own sacred songs. Another very probable occupation may have been superintending the musical education of those who were training for the splendid service of the future temple; for it appears, that in his old age, when he had resigned the kingdom to Solomon, the number of the singers set apart for this service was two hundred and eighty-eight, and the number of the Levites taught to play upon instruments made by David himself was four thousand. This is the first conservatorio of which we have a distinct record; and we cannot hold it in light esteem, when we observe that David himself prepared the poetry, the music, and the instruments, that it was constantly under the eye of the king, and that it was intended as an academy for the education of those who were to officiate in the highest and most interesting service known to the nation, the service of the temple. What those instruments were that were invented by David, or which were in use in his day, it is now in vain to inquire. Nothing is left, from which even a probable conjecture can be formed. All we know is, that they were of various sorts, of both wind and stringed instruments, the names of which have been translated, to be sure, into various languages, but, so far as we are concerned, might as well have been left in the original Hebrew.* The lute, the pipe, the timbrel, the trumpet, the horn, are English words certainly, as well as the harp, the cymbal, the drum, and the organ, but they may, and probably do, stand for things very different in character from David's instruments; while it would be difficult for a mere English scholar to give a definite idea of what is meant by a psaltery, a shawm, or a sackbut. Here are already twelve instruments, and it seems not improbable that others are intended by the words *neginoth, gittith, sheminith, &c.*, which occur in the titles of the Psalms, and which have been a sad stumblingblock to the learned commentators, who would have been satisfied, could they but have fallen upon an English name, with some degree of plausibility. At all events, we may feel some confidence in the assertion, that the accompaniment of instruments to Hebrew music possessed considerable richness. And, if we believe what is stated in the first book of Chronicles, that the singers "were employed in that work day and night," we can have little doubt of their accomplished skill.

The reign of Solomon was pre-eminent, in the history of the Jews, for every thing which elevated them in the relative rank of nations. Their subsequent intestine divisions, and subjugation to a foreign yoke, prevented them from retaining the taste for music, which had flourished in the days of their national prosperity; and we hear no more of their skill in the art, or their fondness for its practice. The only other nation, whose music can be traced back to so high an antiquity as that of the Jews, is the Egyptian; but, in ascending to so remote a date, we are lost in a cloud of uncertainty, which rapidly gathers into the night of total ignorance. It is but stating the truth to say, that the amount of our knowledge respecting it is, that the Egyptians had some kind of music, and some kinds of musical instruments, though what they were it is impossible to determine; that music was much studied and held in honour among them, and that from them was derived much which was afterwards known and practised in Greece.

It is in the music of Greece and Italy, that we are naturally more interested than in that of any other of the people of antiquity, on several accounts. The Greeks were more refined in various ways, than any other nation, and we know more of their character, history, and habits. Their literature is more familiar to us; and though all that we know of their music amounts to but little, yet even that little is unknown with respect to the music of all other civilized inhabitants of the ancient world. It is extremely difficult to rescue that which may seem probable, in relation to ancient music, from the almost unintelligible jargon by which it is covered up, by writers who have interpreted ancient authors according to a preconceived theory of their own, or who have undertaken to translate musical terms without either knowledge of the art, or respect for its theory, and have overlaid with a mass of perplexing erudition a subject already sufficiently involved in obscurity. We shall endeavour carefully to separate what is known and certain, from what is unknown or doubtful, and to distinguish, as clearly as may be practicable, between the probable and the improbable.

The first fact, which is undisputed on all hands, is the intimate connection existing between the poetry in all its forms, the eloquence, and the music of the ancients. Their poets sang their own compositions, their orators were attended by musicians with instruments to give them the pitch of their voice, and their dramas were sung as well as acted. It has been asserted that they had no music unconnected with the voice, though one can scarcely imagine an assertion more entirely gratuitous. The mention of instrumental music is, to be sure, rare among the authors to whom we must recur for information on the subject; but let us suppose for a moment an age of barbarism to supervene on the present state of the world, and all existing literature and art to be blotted out, and then recovered again as those of the Greeks have been. It would not be very difficult, one would think, to frame a theory with respect to modern music, which should exclude instruments, except as an accompaniment to the voice, if no writings of a professed musician should happen to be recovered from the common destruction. In works of general literature, music is rarely described in such a way as to give precise and accurate ideas of its character; and, though the shapes assumed by literature in modern times are so much more various, though we have tours, letters, dictionaries, and a thousand other productions which the Greeks had not, yet we can easily conceive of an Australian antiquary, some two thousand years hence, asserting with the confidence to which his researches may entitle him, that the instrumental music of the ancient Europeans, and their less cultivated descendants in America, was merely used as an accompaniment to the voice; that part of their religious worship was the singing of psalms accompanied by the organ; that in their social meetings the piano accompanied the song, and at their theatres the whole object of the orchestra, composed as it was of all the instruments then known, was to sustain the voice of the singer, and fill up the short pauses required by the meaning of the words; indeed, that the only use that can be discovered of instrumental music independently of the voice, was to regulate the step of a procession or of a military corps. This sounds absurdly enough, and we should say that our Australian descendant might give us a little more credit for progress in the art, though he could not find any account of instrumental music in the poems of Cowper, or the essays of Johnson, the Dramas of Racine, or the History of Hume. Why is it not equally absurd to make such an assertion with regard to the ancient Greeks? They were a people of at least as much ingenuity as any that have since existed; they had a decided taste for music, and, if we may judge by the general accounts of its effects which have reached us, great skill in its execution; they had instruments of many kinds, both wind and stringed, and yet they never could play unless some one sang. It is enough to state such a proposition; reply is unnecessary. We know, too, that music was constantly practised by the people and profoundly examined by their philosophers. The best treatise of ancient music, that has come down to us, is by Euclid, in which he examines the relation of harmonic sounds; and if we understood what he treats of without explanation, as familiar to all, we should probably arrive at some more just ideas of ancient music.

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* Our English Bible says, "Jubal was the father of all such as handle the harp and the organ." Jubal's organs were probably not like that of York, or of Haarlem. But the French translators thought proper to call Jubal the father of all such as handle the violin and the organ; thus carrying the invention of the fiddle farther back than the painter who put one into the hands of Apollo.

Another thing which is generally agreed on by writers on this subject is, that the Greeks had but two divisions of sound in regard to time, namely, a long and a short one, and that the latter was just half the length of the former. Brilliant music this would make! The rudest inhabitant of Central Africa has a greater variety than this, and a better idea of musical rhythm. Just imagine Sappho whining out her lyrics in alternate longs and shorts, or Timotheus drawling before Alexander, "softly sweet, in Lydian measures." The softer the better, one would think, in such measure. But it cannot be imagined. It is utterly inconceivable, that the instincts of nature should be tamed down to such miserable insipidity in a people of lively imagination, like the Greeks. We cannot but regard it as a piece of that pedantry, which will believe nothing but what is on record, and will insist on interpreting the record according to its own limited conceptions. We venture to take it for granted, without quoting authors to prove it, that the Greeks, as well as the Hebrews, as they had instruments, could play upon them without singing, and that their long sound was subdivided into more than two equal parts.

Another point upon which all must be agreed, as there is no room for uncertainty about it, is, that the ancients had nothing corresponding to the musical score or notation of modern times. They had a name and a sign, derived from their alphabet, for every note of the scale, and according to the most respectable conjectures (see Burney's History) their scale embraced three octaves, or twenty-two notes; they had three genera, the diatonic, the chromatic, and the enharmonic, and fifteen modes or keys, in all of which the name of each sound was different, so that, according to the computation of Burette, the names of their notes amounted to sixteen hundred and twenty. If this be true, the study must have been laborious indeed, and would require the three years, which Plato allowed the young to devote to it, to acquire its elements. There is much, also, which is mysterious, and indeed unintelligible, in the accounts that are given us of the genera and tones, or keys, of Grecian music; and it would be neither interesting nor profitable to attempt the hopeless task of explaining what so many scholars and musicians have failed to make clear. It is indeed manifest, that without a definite idea of the sound of a single note, or an accurate knowledge of a single interval of their scale, and with absolutely nothing to guide us as to their divisions of time, it can be but dreaming and trifling to think of proving any thing precise or satisfactory with regard to the musical composition of the Greeks. If proof be required that we really do know nothing important respecting it, we have a demonstration in the attempt of Meibomius, one of the most learned and thorough of all the commentators on ancient authors who touch upon music, to imitate the Grecian style of singing and playing. Queen Christina, of Sweden, to whom he had dedicated his elaborate work, desirous of obtaining a more accurate idea of the ancient music than she could do from the book, directed him to have instruments made of Grecian construction, to accompany a song composed on Greek principles as he understood them, to which another professor was to add a Greek dance. When the hour of this concert arrived, and the performance began, it was accompanied by the irrepressible laughter of the assembled court; and the enraged Meibomius, after inflicting a box on the ear of the person whom he suspected of instigating the plot, quitted Stockholm for ever.[*] Is it possible to imagine, for a moment, that what excited mere laughter at Stockholm, could have been the delight of Athens two thousand years before? Could a people, of so strong a musical taste as the Greeks, have been so singularly rude in the practice of the art? Or is it more probable that Meibomius, and all who have copied him in his account of ancient music, have fallen into errors, and made assertions not warranted by the accuracy of their knowledge?

One of these assertions, which seems to us of doubtful character, is that the octave of the ancients was divided into two tetrachords; and that this was regarded as the principal division of the scale, instead of octaves. The word *tetrachord* means literally four strings, or an instrument of four strings, such as were some of the earliest harps or lyres used in Greece. The question is, How were these strings tuned? Did they consist, as would be naturally supposed, of the third, fifth, and octave of the tonic, or were they, according to this theory of the tetrachords, the first, *fourth*, fifth, and eight, and the lyre thus divided into the two halves of an octave? It must be recollected that the ancient lyre was played with the hand, or struck with a plectrum, and that there were no fingerboard and bow, like those of the violin, to regulate the sound of the strings. They must necessarily have given the sound to which they were tuned, like the strings of the modern harp. We must believe the ears of the Greeks, then, to have been differently constructed from our own, or to have been most extraordinarily obtuse, if they could have enjoyed the sounds which would have been produced by either the consecutive or simultaneous touching of these strings, "a combination," says Majer, "enough to drive a dog mad." But on the other hand, what could be more natural or more pleasing than to tune them at intervals of thirds, thus forming the fundamental chord? It is worthy of remark, too, that the outside strings were considered as fixed, being the extremes of the octave; and the inside strings as movable, that is, they might be tuned higher or lower. This, on the supposition that the middle strings were the third and fifth, would give an opportunity for a change of key from major to minor, or the reverse, without affecting the outside strings; but it would be to little purpose, if they were tuned as the fourth and fifth. One would think the half of the octave must be as much fixed as the extremes.

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[*] Another version of this story is, that the queen directed Meibomius to compose a mass according to his explanation of the Grecian music, and that its performance was prevented by the inextinguishable laughter of singers, players, and audience. —"*Discorso sulla Origine, Progresso, e Stato attuale della Musica Italiana* di Andrea Majer."

It is extraordinary, if Meibomius, Martini, Burney, and others have interpreted the Greek system of music aright, that they should have imagined the ancients could have thought the fourth and fifth a chord with the first. This is manifestly impossible. It is a discord which the ear rejects with disgust and pain; and neither Timotheus, nor Philoxenus, nor Sappho, nor Apollo himself could make any thing else of it. Why should we insist, then, upon the Greek music being discordant, rather than imagine a few modern scholars to have fallen into error, especially when, from the scanty means of forming an opinion which are left, such an error is very fairly excusable? Still the language of the ancients respecting the tetrachords remains to be explained in some way; and if we may be allowed, without incurring the charge of temerity, to make a suggestion on this vexed subject, we should say the difficulty might, perhaps, be solved, by supposing them to have divided their notes by semitones instead of tones. It is obvious that the interval between major thirds is two tones, or *four* half-tones; and here we have at once a tetrachord of semitones, of which there would be three in every octave,* and the first notes of each tetrachord would be in harmony. Thus C, E, and G would accord with each other, and with the C which would complete the octave, and form the first note of the following tetrachord. We merely throw out this suggestion, without venturing to assert that it would solve the problem, but leaving it to others to justify or reject it. "Non nostrum tantas componere lites."

But the great subject of discussion among the literati, who have treated of ancient music, is whether or not the ancients understood counterpoint, or the arrangement of different parts or voices in such manner, that there should be melody in each, and harmony in the whole together. While some have contended, that this complicated art must have been understood, from the effects produced by music in ancient times, so far surpassing what it is able to do now, others again, not content with denying them the finished skill of modern composers, have even refused them any thing like harmony; and have contended, that the voices and instruments, however numerous they might be, were all in unison. In the absence of all historical record on the subject, one would say that each of these extreme opinions was equally improbable. With regard to the argument from the effects, it has been somewhat ludicrously overstrained. People seem almost to have believed in sincerity, that Amphion built walls, Arion rode dolphins, and Orpheus made trees dance, by the mere power of harmony. Probably the influence of song upon the modern art of navigation is quite as powerful as it was upon the ancient art of masonry; yet no one will contend that sailors are now-a-days very accomplished musicians. Nor can it be imagined, that these strange stories, though not taken literally, yet must be considered as poetical representations of wonderful effects. The results, stripped of their colouring, are no more extraordinary than are constantly produced now; and indeed we are persuaded it must have been no more difficult for Timotheus to have stirred the excitable temper of an Alexander to vehement action, than for a modern songstress to throw an audience into such a kind of ecstatic delirium, as many have witnessed, and some experienced, especially in continental theatres. Let it be remembered, that the greatest effects in music are always produced by the human voice. Instruments and harmony and scientific combinations of tones are all very delightful; but it is the song or the chorus which melts the heart with tenderness, or fills it with joy, or overawes it with sublimity. It is sympathy with emotion expressed, which we feel; and, as the human voice can give greater depth and variety of expression than any other instrument whatever, it cannot fail, as long as human nature continues unchanged, to produce the most powerful effects in music.

And what was there to render ancient Greece less musical than modern Italy? Had they not the taste, refinement, the quickness of perception, the climate, which seem suitable for the cultivation of the art in perfection? And shall we believe, that all this aptitude for music was lost, thrown away upon them, because a few students tell us they had no knowledge of harmony, and no other rhythmical divisions of sound than into one long and one short one? Those who think more highly of names than of nature will believe all this, hard as it may be to credit; but we think the dictates of nature are not to be set aside so easily. The musical ear must have fallen upon harmony by accident, if it could not attain it by study; and, as for their rhythmical divisions, to suppose they had but one long and one short sound, is denying the Greeks the musical instinct, of which, by general consent, they had a large share.

But this question need not be referred to nature alone for decision. There are some passages of ancient authors which would seem to be of difficult interpretation, if the ancients had no just ideas of harmony, but which are perfectly and at once intelligible, if such ideas be conceded. Take, for instance, the following language of Longinus; "For, as in music the principal note derives

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[*] Suppose C to be the tonic, the first tetrachord would consist of C, C♯, D, D♯; the second of E, F, F♯, G; the third of G♯, A, A♯, B.

sweetness from those which are called chords,[*] so periphrasis," &c. (Chap. 28.) He could hardly have used language referring more plainly to harmonious sounds; and what can be made of those few words, unless his ear and those of his readers were accustomed to harmony?

There is also a passage of Tertullian, quoted by Majer, of which the following is a translation.

"Look at the prodigious richness of Archimedes. I speak of the hydraulic organ; so many members, so many parts, so many contrivances, so many passages and combinations of sound, so many changes of mode, a whole army of pipes, and all this one mass!"

Who could better describe the modern organ? Was Archimedes, then, ignorant of harmony? And those who listened to his instrument, were they unacquainted with its effects?

Consider for a moment the construction of the ancient theatrical chorus. It is well known that the Greek dramas were sung; that they were in fact what we call operas; and that the chorus was composed, as in modern times, of all the four parts into which the voice is divisible. Here is a description of it by Seneca. "Do you not see of how many voices the chorus consists? Some are shrill, some deep, some intermediate. The tones of woman are joined to those of man; instruments are added; and individual voices are merged in the union of the whole." Had the man who wrote this sentence no conception of music, except that derived from melody? The idea seems preposterous. It is not contended, that the ancients were familiar with counterpoint in all its modern extent and expansibility; but it is impossible to believe, that their knowledge of music reached no farther than to the production of melody or unison, after a due consideration of the passages quoted. Nothing arrives at perfection suddenly; and, though we are very much in the habit of thinking ourselves perfect, and that the science of musical composition has in our day reached its *ne plus ultra*, yet constant experience demonstrates a constant improvement; and perhaps our children will express as much wonder and pity at our music as we feel for the more imperfect attainments of our fathers. Indeed, if we consider for a single moment the number of changes that may be produced by a few notes, we shall be convinced that the varieties of musical composition are indeed infinite. In an octave there are twelve semitones, and upon any instrument, however simple, containing these twelve sounds, there may be produced four hundred and seventy-nine million, one thousand, six hundred changes. Multiply these by the number of octaves, and the number of instruments now in use, and we have a variety as inconceivable as it is inexhaustible. We are still far from perfection, then, and why should we suppose the ancients to have made no progress in an art, which we practise but incompletely ourselves, and the first elements of which are easily attained?

Another point, which strikes us quite as strangely as this, and which runs through almost all writers on ancient music, is, that the Greeks composed all their music in the minor mode. One might as well imagine all their poetry was elegiac, all their orations funereal, and all their songs death-songs. The earliest music of all countries is generally, like the music of the nursery, of a plaintive character, and in a minor key; but, whenever and wherever music has been cultivated as an art, it has never rested in that primitive and simple condition, so far as is really known; and, in the actual state of our knowledge, or rather of our ignorance of ancient music, it seems to us the very height of presumption to assert, that the ingenious Greeks never got beyond the threshold of musical composition. If any thing can be said to be known of the Athenians, it is, that they were a lively, witty, imaginative race, more resembling the modern Parisians than any other people of the present day; and it would be about as probable, that all French music should be minor, as that all Greek music was. It is a point which, of course, may be established by sufficient evidence; but such evidence has not yet been presented to us.

Of the effect of music upon the character of a people, as well as on that of individuals, a striking example is referred to by Burney and others, the authority for which is no less than Polybius, the judicious and careful historian. The Arcadians were generally distinguished for their mild character and amiable virtues, whilst the inhabitants of Cynætha, one of the cities of Arcadia, were as remarkable for the ferocity and quarrelsome barbarity of their dispositions. This is ascribed by the historian to the neglect of the Arcadian institutions of music; and it is a suggestion, which by no means deserves to be lightly regarded. It is not easy to limit the effect of constant causes; and, if music had been the favourite entertainment of England, instead of bull-baitings, cock-fights, and sparring-matches, it is no very strained inference, that there might have been less of crime on the records of its courts, and less of harshness in the national manners. Certainly the kindred blood of Germany is favourably operated on by the prevailing fondness for music; and it is not easy to believe, that one who is really devoted to so refined and refining a pursuit, can be the victim of the coarser and more violent passions of our nature.

The unbounded variety of expression, of which music is susceptible, renders it easily applicable to all circumstances and situations where emotion of any kind is called forth; and it is a necessary appendage to all public celebrations of events or ceremonies, in which any deep interest is felt. Its connection with the religious observances from which human nature cannot refrain, has in all ages been most intimate, and must continue to be so as long as we seek to express in the strongest manner the deep emotions which are excited by religious subjects. The earliest recorded song is one of praise to Jehovah; and, as we trace the history of music down through the periods of Greek and Roman cultivation, we find it always associated with religious rites. No sacrifice could be acceptable, no pomp could be imposing, if not accompanied by the beautiful or the sublime of musical intonation. Their dramas, too, were originally very much of the nature of religious services. Founded on some tale of their mythology, they were made the vehicles of such religious and moral instruction as the wisest of the ancients could convey; and Livy informs us, that the first introduction of theatrical representations into Rome was expressly for a religious purpose, namely, as a means of averting a pestilence which was attributed to the anger of the gods.

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[*] *Παράφωνοι* is a word which nobody translates, but which, if its etymology may be trusted, is equivalent to the Latin *consonus* and the English *chord*.

Music has, from the earliest periods, been associated with the services of the Christian church. One of the first profane notices of the existence of such a sect is the letter of Pliny to Trajan, in which he says, " They assemble and sing hymns to Christ as a God." Even in those primitive times of simplicity and peril, when the cave and the forest were the Christians' only shelter, and the arch of heaven their only temple, even then rose the choral hymn ; the fullness of the heart could not be repressed, and surrounded by the magnificent and the beautiful of creation, they adored their Creator in " music that whispered a heartfelt devotion in song and in prayer."

In after ages, when the persecuted religion, everywhere spoken against, became the favoured and triumphant system, music accompanied its introduction into the basilica, the temple, and the church. It has been fancifully enough imagined that the style of chanting, which was in use at that period, was derived from some species of more ancient, Grecian or even Hebrew music, thus forming a connecting link between the remotest ages and our own time. It is not impossible ; but that is all that can be said in favour of a notion, which rests, like many others, advanced by the historians of music, on the imagination alone. The chanting of that era, as far as can be learned from the imperfect accounts of it transmitted to us, very probably resembled, in a great degree, that of the priests of the Roman church of the present day, with little variety of modulation, and little regularity of measure. Very much was left to the discretion of the singer, and the influence of tradition; the time was absolutely so, as no time table had yet been invented.

In the progress of taste, the singing in the church became more ornamented ; and it is a curious instance of the uncompromising consistency of human nature, of the perpetual recurrence of the same prejudices and feelings, that complaints were from time to time made of the excessive ornament of music, which, to our ears, would probably be chargeable with any thing rather than too much grace. The *canto fermo* of the church was originally, in all probability, chanting in unison and with great simplicity. When ornaments were introduced, they must have been performed by a single voice, while the rest continued the original chant ; and thus the performance gradually became separated into two parts, of which one was the principal air, and the other a connected accompaniment. This was called *discant*, or double chant ; and, as music became more important in the church, performers were engaged for this service ; and they were employed to sing one part and to *organize* the other, or imitate the sound of the organ in firmness and continuity. At least this seems a sufficiently probable interpretation of a word which can hardly be exactly defined now. The invention of the organ was begun in the early ages of Christianity, though it may not be possible to fix its precise date.

In the reign of Charlemagne a national controversy arose, which, though then settled by royal authority, has been open ever since ; and will be finally put to rest when national rivalry shall cease. The singers of Charles's court attended him to Rome to celebrate the festival of Easter ; and a violent dispute arose between them and the Italian performers, as to the taste and correctness of their execution of the music of St Gregory. The king gave it against his own choir, and employed Italian masters to reinstruct them in the true Gregorian style, which, he said, they had manifestly corrupted. From this period, the close of the eighth century, to the beginning of the eleventh, there was no such rapid or sudden progress in the art of music as to mark any particular point of time as an era in its history. Still, progress was made in it, and facilities were gradually accumulating for its study and its practice. The chanting became double, that is, in two regular parts accompanying each other in harmony throughout ; and the system of notation was improved by the introduction, at first, of a single line, red for the key of F, and yellow for the key of C, above and below which line the notes were ranged, according to the acute or grave character of their tone. This was already a decided improvement on the preceding system of placing a hieroglyphic over each syllable of the word to be sung, representing the name and sound of the note ; but a variety of plans were at different times tried, such as drawing a line for each note, then using six lines for the notes of a hexachord, and afterwards reducing the number of lines to four, and using the spaces also, as in the modern system. The four lines and three spaces were just enough to give a place to each of the seven notes of the octave in the key of C, which was once the only key used in the church, the pure diatonic scale being the only one practised. Afterwards the key of F was introduced, and rendered necessary the use of the flat B, or B *molle*, as it was then called. This rich sound was the first accidental ever heard in a church.* The separation of the notes from the words, by placing them in a score, gave an opportunity for doing what must naturally have suggested itself to the composer, namely, writing the discant or double chant on two separate sets of lines, in which each note would correspond with one of the other part, and with the syllable on which it was to be sounded. This was doubtless the origin of *counterpoint, note against note ;* and from this small beginning has arisen, in the course of ages, the complicated art of the modern harmonist. The earliest notes used were square, or lozenge-shaped, without stems, and were easily and frequently changed in writing into mere points. Hence the word *counterpoint.* Stems were ere long added to some notes to mark a different duration, thus giving a hint of a more exact division of sounds by the time they occupied. Letters were also prefixed to the score, which were gradually corrupted into the clumsy clefs now in use. They were originally intended to mark the key F, or C, and not the voice by which the part was to be sung. Thus we see, that, previous to the commencement of the eleventh century, there was a beginning of many things which served to facilitate both the composition of music and the practice of singing, as lines, notes, accidentals, and clefs. The use of accidentals implies, of course, changes of key.

We say all this was begun before the eleventh century ; for at that time appeared one of those distinguished men, who, effecting much for the progress of the science to which they devote themselves, acquire a renown even greater than their merits justify. This was Guido, the monk of Arezzo, who, in later times, has been held up to reverence as the inventor of counterpoint, and consequently the father of modern composition. From what has been said, it appears that this is rather more than he is entitled to. He doubtless contributed much to the improvement of musical composition in his day, but can scarcely be called the inventor of an art previously existing in its rudiments or simplest state. The praise to which he is entitled, and it is no small amount, is for having banished for ever the ancient names of the notes, and substituted for them six syllables that were found to predominate in the first verse of a hymn of St John, *ut, re, mi, fa, sol, la*. When the sixteen hundred and twenty tremendous names of the ancient scale are recollected, such as *nete synemenon*, *parypate meson*, *hypate hypaton*, *proslambanomenos*, &c., names which could be of no use in singing, and which, if they were not Greek, we should call Gothic and barbarous, it will readily be conceived what an immense facility was afforded to the student of music by the ingenuity of Guido. The progress of his pupils in a few months was equal to that made in as many years under the old system, and he was repeatedly sent for by the pope, to establish schools upon his plan at Rome. Such, however, was the seclusion of the monasteries, where alone, almost, music was then either taught or practised, so infrequent were communications, and so toilsome was travelling, that even this vast improvement was long in making its way into general use. It was not till ages after Guido's time, that the octave was completed by the addition of the syllable *si*, and still later that the Italians substituted the more open and euphonious sound of *do*, for the contracted one of *ut*.

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* It is to be presumed, that those at least, who believe in the Hebrew or Grecian origin of the *canto fermo*, will not contend that ancient music was always in the minor mode.

Great as are the obligations of music to Guido for giving simplicity to its arrangement and the method of instruction in it, yet it may be reasonably doubted if he contributed so much to the progress of the art as the inventor of the time-table, whoever he was. The regular subdivision of notes was not fairly and fully accomplished till the fourteenth century, three hundred years after the time of Guido, and it is uncertain by whom it was then achieved. Musical writers, according to Dr Burney, have heretofore ascribed it to Jean de Muris; but Jean de Muris himself attributes it to Master Franco of Cologne, thus carrying the invention back to the middle or end of the eleventh century. The probability seems strong, that many contributed their efforts, at different periods, to the perfecting of that branch of the art, which yields to none in importance. It was the proper and accurate subdivision of notes, and the strict observance of time, which made music a really independent art. Before that was studied, singing must either have been guided by the intention of the composer, and handed down by tradition, or it must have been entirely *ad libitum*, and at the momentary pleasure of the performer; and if a number of vocal or instrumental performers were to execute a piece of music together, nothing but the most immense and laborious practice could have enabled them to keep within harmonious distance of each other. The difficulties of the art must have been immeasurably greater than at present, and will account for the great number of years that were thought necessary to attain reasonable skill even in its then imperfect condition, and for the very slow progress which was made in its improvement. Think, for a moment, what would be the effect of setting a piece of music before even a well-instructed choir at the present day, in the score of which no measures were marked, and in which but one kind of note, of unvaried form, was used for every tone introduced; a piece, in short, from which all marks of time were obliterated. It is very much to be feared that the skill of the choir would, for a time at least, be baffled, and that the piece, however simple, would be rapidly converted into a specimen of "most admired disorder." This must be distinctly perceived, in order to attain an idea of the condition of music as an art, both in ancient times and in what are called the middle ages. The observance of time, if it does not itself constitute harmony, is certainly a necessary attendant on its existence; it is that, without which harmony cannot be created; and it must be marked, either by the distinctions of notes and rests, or by the direction of a leader, or by the undirected taste of the performer. In ancient days the time was indicated, very imperfectly of course, but still in some degree, by the length of the syllables to which the music was set, and by a leader who beat the time audibly. But in what way it was marked in the chanting of the church, in the first thousand years of Christianity, there are no means of determining. It was, perhaps, a thing of tradition altogether. No wonder, then, the progress of the art both of composition and of performance was slow. No wonder, where so much was left of necessity to the unguided improvisation of the singer or player, that bad judgment was more prevalent than good; and that the art was more and more corrupted from the simplicity which is the guide of correct taste.

Five centuries elapsed from the time of Guido, during which music was wandering in doubt, and obscurity, and weakness, without a guide on whom to rely, and without a definite object of pursuit. This long period was not, however, wholly lost. The caprices of even bad taste revealed some of the powers of song, as the freaks of alchymy developed some of the laws of nature. Rules of composition, and something like a regular system of notation, became of acknowledged authority; and in the fifteenth century the art of printing came powerfully to its aid, as it did to that of every other human pursuit. At length, in the sixteenth century, appeared one of those truly illustrious men, endowed with those great powers, with which the Almighty from time to time adorns our nature, for bringing beauty out of deformity, order out of confusion, and for stamping the impress of his fertile genius on his own and all succeeding ages. This was Johann Pierluigi of Palestrina. He was born at Præneste in 1529, a period when, though the rules of musical composition were beginning to be settled, yet the taste and invention displayed in it were not usually such as to excite admiration or pleasure. So bad was the style of the music performed in the church, that pope Marcellus II., in 1555, was about to issue an edict to abolish the use of it in the sacred office, when Palestrina besought him to hear a mass of a different character from the frivolous, florid music then in vogue, and to give the noble art still a place where it could be most effective. He obtained the permission he asked, and produced a mass, which, by its simplicity and dignity, completely conquered the strong and probably not unjust dislike the pope had expressed for the more popular music of the day. This signal triumph, obtained by a young man of twenty five or twenty-six years of age, not only saved music from the threatened banishment from its sacred home, but placed Palestrina at once at the head of the art, as the best composer, not only of his own, but of all preceding time. This position he never lost, and through all succeeding ages he must continue to be regarded as the successful reformer of a barbarous era, and the father and founder of a better school, which, from that day to this, has been considered as the school of true taste. His compositions were numerous, comprising nearly all descriptions of the serious style now in use. They are still extant, and are not unfrequently performed in Italy by those who have a just reverence for his genius and skill. They may not possess the flowing ease of some more modern productions, but they are of a kind which will never cease to produce a strong effect upon men's minds and hearts. It is a mistake to suppose that there is a particular style of music which is adapted to a particular period of the world. Music is a universal language, and what is able powerfully to affect one generation of men will not fail to affect another. There may be conceits and fancies in fashion at certain periods or places, which soon pass away, because they are not in good taste; but that which can interest and please in tone, imitation, or harmony, will never cease to interest and please. Palestrina had the merit and the glory of pointing out the true path in which music should walk, the true mode in which she must produce her effects; and from his day to the present there has been but one school of good music. Divided and subdivided as the schools have nominally been, correct taste is one and indivisible; and all must be conducted by her guidance, or they cease to be schools of music, and degenerate into academies of uproar. There is, in reality, little to distinguish the so-called different schools, but the different degrees of attainment and genius of the authors who have been educated at different places. The obstacles which have obstructed the progress of some, and the facilities which have surrounded others, may, perhaps, be perceived; but all aim at the same object by the same general means, and therefore belong to the same school. This deserves, in some respects, to be called the school of Palestrina. He pointed out the path in which music may go on for ever improving; he taught men to explore that garden of inexhaustible fertility, in which the plants that he trained still live, and in which the successive brilliant productions of music will remain for ever fresh and fair. We do not mean that it is impossible to point out differences between the composers of one nation and those of another, or to deny that some are more successful in melody, and some in harmony; but as we hold that both are necessary to the production of the best music, any defect in either must be counted as an imperfection in the author as a musical composer, to whichever school, as it is called, he may belong.

From the days of Palestrina until now, the musical taste and the musical productions of the civilized world have increased in an accelerating ratio. Invention has been applied, not only to the writing of music, but to the instruments by which it is to be performed, and the art of execution on those instruments; so that each successive age has reached a point, both in composition and performance, which was either not thought of, or deemed unattainable, by its predecessor. Since his time, too, another style of music has been introduced, and become so much a favourite as almost to supplant the more venerable music of the church, which was the first to be brought to some degree of perfection, and was the foundation of all that has succeeded. Towards the close of the sixteenth century music began to appear in company with the dramas, which were then popular; and, rude as the first essays probably were, and imperfect as the instrumental accompaniment certainly was, the effect produced upon the feelings of the audience was great beyond any thing known in those days, and was compared to that of the ancient Greek and Roman dramas.

The *moralities* and *mysteries*, the title under which the drama first appeared in the middle ages, were frequently performed by strolling companies upon an ambulatory stage; and there is an interesting account in Della Valle, of the first secular musical drama in Rome, which we shall extract from Dr Burney.

"The musical of my *cart*, or movable stage, composed by Quagliati, (his master,) in my own room, chiefly in the manner he found most agreeable to me, and performed in masks through the streets of Rome during the Carnival of 1606, was the first dramatic action, or representation in music, that had ever been heard in that city. Though no more than five voices, or five instruments, were employed, the exact number which an ambulant cart could contain, yet these afforded great variety; as, besides the dialogue of single voices, sometimes two, or three, and, at last, all the five sung together, which had an admirable effect. The music of this piece, as may be seen in the copies of it that were afterwards printed, though dramatic, was not all in simple recitative, which would have been tiresome, but ornamented with beautiful passages, and movements in measure, without deviating, however, from the true theatrical style; on which account it pleased extremely, as was manifest from the prodigious concourse of people it drew after it, who, so far from being tired, heard it performed five or six several times. There were some who even continued to follow our cart to ten or twelve places where it stopped, and who never quitted us as long as we remained in the street, which was from four o'clock in the evening till after midnight."

The scholar will remark the curious coincidence between the earliest dramatic representations of Greece and of Italy; and the musician will cease to wonder at the effects of ancient skill, when he reflects upon those of Della Valle's ambulatory *cart*. It may be observed, that here is an early mention of recitative, which seems to have been coeval with the secular drama, and which corresponds, in some degree, with what was originally called chanting in sacred music. It is the chanting of the theatre, with greater variety and expression than that of the church, but quite as far removed from the graceful regularity of the air or song.

During the succeeding century the opera gradually assumed its regular form, and became an established branch of public amusement. It was not, however, till perfected by the dramatic genius of Metastasio, that it assumed the high rank it has since maintained in theatrical literature. The last century was, in all respects, the most interesting and important period, which has occurred in the history of music. New branches of the art were cultivated, while those previously known were vastly developed and improved, by the genius of the greatest composers the world has yet seen. It would be at once useless and uninteresting to in sert, in this rapid sketch of the progress of music, the long list of the names of those who, with various success, have devoted themselves to its different departments. Nor will it be possible to assign to precise dates, or to particular individuals, the improvements in instruments and methods of performance, which have successively added to the power of music and the means at the disposal of the composer. We must remain satisfied with the general fact that each following age has had greater resources than its predecessor, and with the probability that succeeding times will go on improving, as long as man is endowed with ingenuity, and feels an interest in the illimitable, the divine art. It is impossible, however, even to think of music without instantly recollecting the names of those illustrious men of the last century, who are identified with its very existence, and who, if no other composers had ever written, would have sufficed to make the era glorious, and to furnish the highest pleasures of music to all after time. We refer, of course, to George Frederick Handel, Joseph Haydn, and John Chrysostom Wolfgang Amadeus Mozart.

Although climate and scenery may affect the character of a national music, they can neither cause nor prevent its growth. In a clear and elastic atmosphere and a genial climate, the voice is generally more flexible and clear than in a cold and damp region. This would perhaps have an effect upon the music of such a country during its gradual formation. Italy is called the "land of song;" not probably because the Italians are a more musical people than the Germans, for instance,but because the voice is more generally good, and consequently there is more vocal music in Italy. No traveller can fail to be impressed with the appropriateness of the appellation. This difference would lead us to expect, what we find to be the case, on comparing the Italian with the German music. The former is more simple, more distinguished by melody, more passionate. The latter is profound, complicated, metaphysical, often more grand and sentimental. The former, from its simplicity, indicates that it is the music of the voice; the latter, by its rich and compound harmony, appears to be the result of instruments combined.

Natural scenery may also exert an influence on the character of a nation's music. It is difficult to imagine the same music to be the growth of the sunny plains of Lombardy, and of the awful scenery of the Alps, or the wild shores of the northern seas. Whatever influences are exerted upon national character by these differences, must become apparent in music, if the nation has any. And although we have no faith in the theory, that music is merely the result of man's imitative propensities, we have at the same time no doubt, that it is in a degree modified in every country by the prevalent sounds. For instance; in a land of tempests, where the mournful sigh of the coming storm, or the roar of its fury, and the deep, angry, and incessant roll of the ocean are constantly heard, we should expect to find corresponding tones in the music. But a milder region, where the song of birds and the busy hum of insects is continually heard, where the prevalent sounds of nature, the breeze, the purling stream, the cataract, are of a cheerful character, and where, from the gentleness of the scenery, even the storm is robbed of half its terrors, we should suppose that the music would partake of this character. And this we believe will be acknowledged to be the case, as far as experience goes.

But such influences as these can never create a national music. The climate of England is as well fitted to make musicians as that of Scotland or Germany, and the scenery is as lovely as that of Italy. What, then, prevents England from having her own music? Many reasons may be assigned. In the first place, England has been cut off from the inheritance of her earliest music. Her earliest race, when they retired to the mountains of Wales, carried with them their language and song. Those strains, however wild and uncouth, which their bards poured out, would, if they had continued to be heard in England, to be listened to, reverenced, cherished, and repeated from age to age, have become gradually more and more polished and harmonious, while at the same time they would have been as strongly stamped with individual character, as the music of any nation now is. The outpouring of the heart in song, the expression, in this form, of national character, the strains which nerved the rude warriors' arm, or which were thundered forth by victorious bands, would never have been lost; but, even at this day, we should have heard strains, which perhaps struck terror into the hearts of Julius Cæsar's troops, or which resounded through the mysterious groves of the Druids.

It is thus that a national music is formed. The strains which are poured forth from an enthusiastic people, which really give utterance to popular emotion, are its first origin, and give it an indelible stamp. This enthusiastic outpouring of song generally happens only in the infancy and rudeness of nations, while superstition blinds and mystifies, while the passions are vehement and uncontrolled, and the poetry of life is untamed. The same causes which make a rude age poetical, would also give birth to music. The progress of the national music is afterwards analogous to that of the language. It is softened, improved, polished; but it remains essentially the same. The features which were derived from the deep sources of national character are never changed. The early airs are repeated from age to age, and others are fashioned from them, bearing the same distinctive character. Thus it has been with Scotland, with Ireland, and with Wales.

The first race with which England was peopled retired before the invader, and a new people, with another language, other customs, and other characteristics, took possession of the soil. These too undoubtedly had their music, as well as their language and their poetry. And, had the Saxons continued to be the people of England, their music might perhaps at this day have been prominent in the fine arts. But the Saxons were invaded and conquered; and where did a conquered people ever preserve their song? "They sat down by the rivers of Babylon and wept;" they hung their harps upon the willows, and their sound was heard no more.

The Norman came with his romances and his minstrels. But the song of the minstrel was of earlier times, and of heroes long gone by. The language he spoke was soon modified, varied, and finally changed; and the two nations, the conqueror and the vanquished, became blended like their languages, till the original characteristics of both were confused and almost lost. With the growth of the English language came the age of reality. The poetry of life was fast fading away. The time when national music is born had gone by in England, and the song of earlier days was lost.

Thus England was deprived of her traditionary music. Other circumstances, adverse to the growth of music as a creation of art, may be traced in her history. We speak of music as a creation of art, in contradistinction to the music which is handed down from a rude age, and whose origin is lost in antiquity. Among a highly endowed and enlightened people, music, as an art, may spring up at any time. Wherever there is a strong taste for it generally diffused throughout a community, composers will be sure to appear. Wherever a nation is peculiarly excited by powerful sentiment, this feeling is likely to burst forth in song. Thus, for instance, the Marseilles Hymn may be considered a genuine offspring of national enthusiasm.

Let us briefly compare the musical history of England with that of Italy. In the former, as we have seen, the traditionary music was lost. In the latter it was in some degree, at least, preserved; and was inherited, perhaps, from the remotest antiquity. For many centuries music in Italy was only preserved by the Christian church, having been solemnly proscribed at Rome after the death of the emperor Nero. The airs of ancient Rome, inherited perhaps from the Etrurians, the Oscans, or the Greeks, were chanted by the early Christians at their secret devotions, and were preserved by their enthusiasm and piety, when they could no longer be heard in the stately abodes of the senators. And this ancient music, it is believed, has never been lost, the Gregorian chant being nothing more nor less than the classical music of Rome. Thus, although music was almost extinct for a long period, it never perished; and when, after almost disappearing from even the church, it was revived by Ambrose, bishop of Milan, and improved by pope Gregory during the fifth century, Italy then was in possession of her traditionary music.

But the art owes its perfection in Italy to the efforts of the church. An institution which depends so much upon affecting the senses of its devotees, would not of course omit to use so powerful a means as music. And accordingly we find that both the oratorio and the opera owe their existence to the efforts of churchmen to promote a spirit of devotion in their followers. The earliest form of the spiritual drama was presented by the Christian pilgrims, who, on their return from the Holy Land, used to accompany their dramatic representations of the life and sufferings of our Saviour and of the Apostles, with songs and choruses descriptive of the same. About the middle of the sixteenth century, Philip of Neri established regular oratorios in Florence, with the declared object of calling the public attention to religious subjects. The sacred opera had already assumed a more complete form than the representation of the pilgrims. A religious drama had been performed at Padua in the thirteenth century; and it appears, that the "Annunciation" was enacted every year at the city of Treves.

From sacred to profane subjects the step was easy. Politian produced a musical drama on the story of Orpheus, in the latter part of the fifteenth century, and thus the opera was established.

It was the good fortune of Italy, that a refined state of living,—wealth, luxury, and elegance, and with them elevated and refined tastes,—were acquired before the enthusiasm and devotion, which mark a ruder condition of society, had departed. The church still continued to direct the taste, and to influence the heart, long after the rough features of barbarism had disappeared from Italy; and the church, as we have seen, took music under its peculiar patronage. Music, like the other fine arts in Italy, was the offspring of enthusiasm and a romantic spirit, united with civilization, refinement, and wealth.

The case was entirely different in England. We have seen, that the revived music of Italy was founded on the traditionary airs of the country. Had these been lost, the music might now have been of a very different character. In England there was no such foundation to build upon. In Italy the growth of music was owing to the efforts of the church. But all such influences were almost lost in England. The Romish church never exerted the influence on the arts in that country that it did in Italy, because its power was lost before England became refined enough to take pleasure in the fine arts. While Giotto was painting the walls of the Campo Santo at Pisa, and Lorenzo Ghiberti was casting his gates of Paradise for the old Lombard church in Florence, the English were industriously occupied in cutting their own throats and the throats of their neighbours. The reformation came; and with it a severe spirit, which looked with aversion upon outward forms and ceremonies, and all the magnificent paraphernalia of the Church of Rome. Many of the decorations were removed from the churches, many of the forms were interdicted, and the splendour of worship was much diminished. Little or no encouragement was given to the arts by the Church of England down to the time of Charles I. Then the spirit of Puritanism began to breathe its sternness over the land, and its effects were to retard the growth of the fine arts in England more than a century. In the midst of all these changes, that enthusiastic spirit which gives birth to art was lost. The fervour of the puritans, had their doctrines allowed it, might have originated a new and impressive music, which succeeding refinement would, perhaps, have improved to rival the music of Germany or Italy. But, unfortunately, all such accomplishments and exercises were denounced, and the barbarous twanging hymns of the puritans had no other effect than to destroy even the little taste for the art previously existing in England.

We have endeavoured to give a few of the more obvious reasons for the non-existence of English music, because we like to account for this want from external causes, rather than from a deficiency in the national capacities. We do believe, that, but for unfortunate influences, there might have been a musical literature peculiarly English; but, at the same time, we are forced to the conviction, that there is not in England so keen and delicate a perception of art, generally speaking, as in many other countries.

For many centuries the romance of life has been but little known in England. Even in the brilliant reign of Elizabeth, it was confined to a comparatively insignificant number. True, the accomplished Surrey went abroad proclaiming the charms of his fair Geraldine with spear and sword; Sidney realized in his own person the ideal virtue and courage of the heroes of the round table; Raleigh, and Essex, and Hatton, and many a noble knight beside, preserved the golden age of chivalry round the throne of their mistress. But, beyond the magic circle of the court, the romance of life ceased. It found no home among the people. There was nothing of that wild and poetical existence, which, for 150 years afterwards, was found in the highlands of Scotland.

But it may be said, there was as much of the romance of life in England as in Italy, from the time of the Medici downwards. This may be true, and yet nothing can offer a greater contrast than life in these two countries. We do not refer merely to the style of living, the manners and customs, the degree of comfort, and the amount of external conveniences; but to the spirit of society, the objects of life, the callings of men, the most important and absorbing interests. In England, life is business. Its objects are, improvements in the accommodations of existence; the means of keeping out the cold and wet; commerce, manufactures, voyages of discovery; and, above all, the absorbing game of politics, whether in the forum or the battle-field. These are the great and serious objects of Englishmen. Accomplishments, arts, amusements are the mere ornaments of life, but little prized, and never brought into comparison with the other weighty matters.

In Italy, the case is very different. There, life is art. The weighty occupations, the important business, the concerns of states, and the interests of governments, are art. Cities are more proud of their statues and their pictures, than of their convenient streets and their ingenious by-laws. States boast more of their artists, than of their internal improvements. And this admiration of the fine arts is not confined to the wealthy and refined. It pervades all classes, and becomes the high interest and the pride of all. Italy is, in truth, the *republic of art*. Music, sculpture, poetry, painting, are not there the exclusive property and privilege of any class. They belong to all. They are claimed and enjoyed by all. A few remarks of Bombet's, where he is speaking of the inutility of transferring the objects of art from Italy to France, are in accordance with what we have just remarked. He tells us, that, at Milan, we hear of Titian's "Christ crowned with Thorns," as soon as we arrive. At Bologna, the street valet will direct your attention to the St Cecilia of Raphael. "At Rome," he continues, "the person best known, and in highest estimation, is Canova;" "at Rome they will talk for a fortnight of the manner in which the fresco of the convent of San Nilo, painted by Domenichino, is going to be transferred to canvass. At Rome it is the great artist who occupies the public attention; at Paris, it is the successful general, or the favourite minister,—Marshal Saxe, or M. de Calonne."

These differences between England and Italy arise, rather, we apprehend, from the natural superiority of the latter country, than from any adventitious circumstances. The Italians have a keener sense of art than the English. Music is the native growth of the country; it is universally understood, loved, and practised. In England it is an exotic; of slow growth, and fit only for the saloons of the wealthy. There is an atmosphere of music in Italy. People hear it from their birth. It becomes one of the invariable concomitants of life. To be without music is not a conceivable idea. The fine arts are indispensable with Italians. They are more needed and more sought than those comforts which in England are prized as the first requisites for living. The Italians, to borrow the idea of a witty acquaintance, can get on without the necessaries of life; but the luxuries are absolutely indispensable.

This want of a general capacity to enjoy music or to appreciate it, in England, is, we believe, more than any adventitious difficulty, the reason why they have no national music. It is not enough, that the art should be cultivated by the wealthy; that the opera should be munificently supported, and that foreign performers should carry away fortunes from the kingdom. We would give more for the chance of a national music in a country where the labourers sing at their toil, or join in chorus as they return from the fields, than in that which devotes millions to the building of opera-houses, and the importation of performers.

The assertion, that England has no music, ought undoubtedly to be qualified. In saying this, we mean, in the first place, that there is no music which, from its peculiar character, we pronounce unhesitatingly to be English. We are never at a loss to distinguish Scottish music, or German, or Italian; but what are the characteristics of English music? In this sense, we consider that it does not exist. Again; there is no class of composers belonging to England, whose works form a distinct musical literature. Half a dozen writers of equal merit with Arne would have created such a literature; but they are not to be found. Handel we do not rank as an English composer; were he so, England might indeed boast of her national music. Yet we must acknowledge, that, by adopting Handel's music so completely, England has done all in its power to make it national.

The nearest approach made to a national music in England is perhaps in the cathedral chants and anthems. Here we think a peculiar and distinctly marked style may be discerned; and in this class of compositions are to be found many honoured names. Some of the composers of these lived in the early days of music; as Richard Fevrant, who flourished in the former portion of the reign of Elizabeth, and William Bird, who was born about the year 1543, and whose famous canon, *Non nobis, Domine*, has been ascribed to Palestrina, the father of modern melody.

In speaking of the national music of England, it seems only just to cite a remark of the earl of Mount Edgecombe, which appears in the "Musical Magazine." He says; "There is another species of composition more peculiarly our own, and which I should call our only national music; I mean *glees*, which differ from any thing I ever heard, and in their style cannot be excelled. Their harmony is so full, rich, and melodious, when executed, as they long were, by the Messrs Knyvett, and the other performers accustomed to sing them together, that they completely gratify the ear; and he must be indeed fastidious, or greatly prejudiced, who cannot receive pleasure from their performance.—If the leading voice permits itself to wander from the strict melody of the air, in order to show grace or agility, as is too frequently the case when singers accustomed to other styles are called in, the effect is injured instead of improved, as the great beauty of those compositions is derived from the complete union and equality of all the voices, none preponderating, and from the simplicity of their execution. They then produce the effect of full chords struck on a finely-toned organ."

Our conclusions are, then, that England is less gifted with a sense of art than many other nations, and that this deficiency, connected with various adverse circumstances to be traced in the history and condition of the country, accounts for the want of a national music. At the same time we are of opinion, that, but for these adverse circumstances, English music would have at this time been in existence.

N

NAPIER, William John, ninth lord Napier of Merchistoun, in the peerage of Scotland, was born at Kinsale, in Ireland, October 13th, 1786. At the age of sixteen he chose the navy as his profession; and he was a midshipman on board the Defiance at the battle of Trafalgar, when that ship captured the St Ildefonso, and carried the prize into Gibraltar. He afterwards served on board the Foudroyant, and the Imperieuse, captain lord Cochrane, who, in his despatches of the 7th of January, 1807, noticed him as having distinguished himself in a boat attack on Fort Roquette on the preceding day. On the 14th of November following he commanded one of two boats which captured a privateer of eight guns and fifty-four men; and was one of twelve in his boat who were wounded, two of whom died. On the 20th of February, 1808, he assisted in cutting out of the bay of Almeira a French letter of marque of ten guns, two brigs, and a large settee. Being sent to conduct an unarmed vessel, detained by the Imperieuse, to Gibraltar, he was, on his passage, taken by a privateer from Mahon, on April 3d, 1808, and carried into Ivica, where he remained a prisoner for three months. He was released when the Spaniards began to throw off the French yoke, and afterwards assisted in the defence of Fort Trinity, and at the siege of Roses. He was on board the Impérieuse, April 12, 1809, when the Calcutta was taken. On the 6th of October following he received his commission as lieutenant; from which period he served in the Kent seventy-four; and Sparrowhawk, eighteen, until his promotion to the rank of commander, June 1, 1812. He was wounded in the attack on Palamos, December 14, 1810. His first ship as commander was the Goshawk 16, stationed on the coast of Catalonia, where he had the misfortune to be wrecked September 21, 1813. In March, 1814, he was appointed to the Erne corvette, of twenty guns; and in June following he obtained a post commission. On the peace in 1815, lord Napier retired from active service; but previous to his settling on his family estates, although then in the twenty-ninth year of his age, he entered the university of Edinburgh, and spent the first winter there in a course of study. He then commenced a series of agricultural pursuits, with quite as much energy and success as he had followed his profession. Uniting objects, neither of them easy of attainment, the improvement of his family estate with the comfort and happiness of the peasantry who resided on it, he succeeded in making himself beloved by his father's tenants, and esteemed and respected by the whole neighbourhood. His lordship wrote a treatise on the system of agriculture best adapted to the pastoral district in which he resided. On the 1st of August, 1823, he succeeded his father in the peerage. He was recalled to his profession on the 6th of May, 1824, having obtained the command of the Diamond of forty-six guns, then fitting for the South American station. On this station he remained about two years and a half, and then returned to his native country. In December, 1833, he received from the king a commission appointing him principal superintendant of the trade of the British nation in China. The interest at present attached to the Chinese question, induces us to give a somewhat detailed account of the proceedings consequent on this appointment. It would appear that his lordship's instructions empowered him to take a "high hand" with the Chinese, but in this he was not supported by the British merchants.

Lord Napier arrived at Macao, in his Majesty's ship Andromache, on the 14th of July, 1834. Notice of his lordship's arrival was immediately sent to the Hong merchants at Canton; and was by them forthwith forwarded to Loo, the governor of Canton, who issued instructions, dated the 21st of July, that his lordship should continue at Macao, and if he wanted to come to Canton, inform the merchants, that they might previously petition the governor, who would send the petition by post conveyance to Pekin. The distance of Pekin from Canton makes it a postage of at the least eleven days, and the return would have occupied eleven more; to which must have been added whatever time his imperial majesty might have thought fit to require for deliberation respecting the manner in which he should regulate the intercourse his lordship had been sent to superintend. To this delay lord Napier determined not to submit; and accordingly waiving all ceremony, and dispensing with the honours of a public entry, his lordship first appointed his coadjutors, and particularly the late Dr Morrison, to conduct his correspondence with the Chinese; and then, accompanied by them, betook himself to his boat, late in the day, on the 24th of July; and after encountering a stormy and rainy night on the Canton river, landed on the morning of the 25th at the factory at Canton, a building which has been allotted by the Chinese for the temporary residence of the English merchants. On his arrival at Canton, he sent a letter to the governor, which was refused at the city gates; in consequence of its superscription being that of a letter, instead of a petition. On the 27th of July, the governor issued a second order, wherein, after repeating part of the first, and referring to the past days of tranquillity, and ordering the merchants, linguists, and compradors to instruct the "new-come barbarians in all things," he proceeds to remark that hitherto the foreigners coming to Canton have been permitted to request and receive leave from the hoppo; and he then observes:—"On this occasion, the barbarian eye, lord Napier, has come to Canton, without having at all resided at Macao to wait for orders. Nor has he requested nor received a permit from the superintendent of customs, but has hastily come up to Canton,—a great infringement of the established laws. The custom-house writers and others, who presumed to admit him to enter, are sent with a communication requiring their trial. But, in tender consideration for the said barbarian eye being a new-comer, and unacquainted with the statutes and laws of the celestial empire, I will not strictly investigate. But it is not expedient that the said barbarian eye should long remain at Canton provincial city; it must be required that, when the commercial business regarding which he has to inquire and hold jurisdiction is finished, he immediately return to Macao; and hereafter, without having requested and obtained a permit, he cannot be allowed to come to Canton. The great ministers of the celestial empire are not permitted to have private intercourse by letter with outside barbarians. If the said barbarian eye *throws in* private letters, I the governor, will not at all receive or look at them. With regard to the barbarian factory of the company without the walls of the city, it is a place of temporary residence for barbarians coming to Canton to trade. They are permitted only to eat, sleep, buy and sell in the factories. They are not permitted to bring up wives and daughters; nor are they permitted to go out to ramble about. All these are points decided by fixed and certain laws and statutes, which will not bear to be confusedly transgressed. To sum up—the nation has its laws; it is so every where. Even England has its laws. How much more the celestial empire! How flaming bright are its great laws and ordinances, more terrible than the awful thunderbolt! Under this whole bright heaven none dares to disobey them; under its shelter are the four seas; subject to its soothing care are the ten thousand kingdoms. The said barbarian eye, having come over a sea of several myriads of miles in extent to examine and have superintendence of affairs, must be a man thoroughly acquainted with the principles of high dignity; and in his person he sustains the duties of an officer, an 'eye.' He must necessarily in every affair act in accordance with reason; then only can he control and restrain the barbarian merchants. I, the governor, looking up, will embody the extreme wish of the great emperor, to cherish with tenderness the men from a distance; and assuredly I will not treat slightingly the outside barbarians. But the national laws are extremely strict and close-drawn; we dare not in the least transgress. Let the said barbarian eye be very careful not to listen to the artful instigations of evil men, enticing him, until he fails of the object of the said nation's king in sending him so far. Uniting all, I issue this order to be enjoined. When the order reaches the said merchants, let them immediately act in obedience to it, and enjoin the order on the said barbarian eye, that (he) may know it thoroughly. Oppose it not. The said merchants have had intercourse with the barbarians for many years: their knowledge of their language and feelings must be good; the linguists and compradors are more closely allied to the barbarians. If they truly explain clearly, opening and guiding the understanding, the said barbarian eye assuredly cannot but obey. If there should be disobedience and opposition, it must be owing to the bad management of the said merchants, and to the instigation of the linguists. Assuredly, the said merchants shall be reported against, that they may be punished; and on the linguists the laws shall instantly be put in full force. [A phrase for capital punishment.] Their respectability, their lives are concerned. Tremble fearfully hereat! make not repentance (necessary)! These are the orders."

"Taoukwang, 14th year, 6th moon, 21st day."

Lord Napier positively refusing to quit Canton, a third order was issued, dated 30th July, in which the governor threatens to report the Hong merchants to the emperor, and commands that the "barbarian eye must immediately set off and leave the port, and not stop in the foreign factories outside the city loitering about."—"The affair," it is added, "concerns the national dignity. I, the governor, will be able only to report against the said merchants that they may be brought to trial." The following day, a fourth order was issued to the Hong merchants, who appear to be made the unfortunate scapegoats, in which the governor calls upon them to obey former orders, "to ascertain clearly for what the barbarian eye has come to Canton, and why, in disobedience of the regulations, he has not requested a red permit." They are required "to compel him, immediately, with speed, to return to Macao, and reside there till the governor shall have made a prepared report, to request the imperial will be made known, that it may be obeyed. Should there be any opposition," it concludes, "the said merchants will be held solely responsible." The orders of the viceroy and hoppo were by the Hong merchants attempted to be delivered to lord Napier, but his lordship declined to receive them. The Hong merchants, in consequence, offered to be the medium of communication between the viceroy and superintendent. This offer was likewise refused. Several fruitless negociations followed, into which we cannot here enter.

On the 2d of September, an edict was issued by the viceroy, announcing the stoppage of the British trade. The edict declares that it is becoming that the ships' holds should, according to law, be closed, and directs that buying and selling on the part of the English nation shall be put a stop to from the 16th of August, and that the Hong merchants shall withdraw all Chinese servants from the factories. A free exportation of all articles contracted for previous to the 16th of August was allowed. In consequence of this edict, the British superintendents were cut off from a supply of food, by the Chinese and all foreigners, and lord Napier and his suite were reduced to live on mess beef and pork from H. M. ships. On the 5th of September, lord Napier wrote to the secretary of the British merchants (Mr W. S. Boyd,) with reference to this edict, representing the stoppage of the trade, after the grant of indulgence and delay by the viceroy's order of the 18th ult., as "a ground of grave complaint and remonstrance to the viceroy on the part of the British;" and he observed, that the permission to embark goods paid for up to the 16th was vitiated in a great measure by the prohibition to land cargoes from the ships daily expected for the very purpose of embarking the cargoes so contracted for. His lordship declared his intention to make these two points "subjects of discussion with the authorities;" and with reference to the interdict of Chinese servants and workmen, his lordship stated that, with a view of remedying the inconvenience from the desertion of the Chinese servants, and to afford a protection to the company's treasury, it had been requested that a guard of marines might be landed within the premises, and that H. M.'s ships Imogene and Andromache might pass the Bogue and take up a convenient position at Whampoa, for the more efficient protection of British subjects and their property. On the 7th of September, H. M. ships Imogene and Andromache, under the command of capt. Blackwood, got under weigh to proceed through the Bogue. A stir was immediately perceived among the war junks in Anson's Bay, and the Chunpee and Taykoktay forts. All of them at first commenced firing blank cartridge, and the two forts followed it up immediately with shot, which from the distance fell far short and astern of the ships. The junks (about a dozen), got as far as they could into the shoally recesses of Anson's Bay. As the ships got within range of the Bogue forts, the wind suddenly shifted to the north, the Imogene standing towards Wangtong Fort on one tack, and the Andromache towards Anunghoy on the other. The Imogene waited until Wangtong had fired several shots, when the last one having nearly reached her was answered by two; another was answered by two more in quick succession; the Andromache, in the meanwhile, returning the fire of the Anunghoy battery with several well-aimed shot, some of which plunged into the parapet with prodigious effect, and raised clouds of dust, while others passed clean through the embrasures. The British fire, while it lasted, silenced the forts; but as it soon appeared that any pause on the part of the ships produced a renewal from the batteries, it became necessary to discontinue the order to "cease firing on the maindeck." The action was most brisk on getting into the middle of the channel; but the Chinese fired like men in a panic, aiming very wild, or rather letting fly as the ships arrived nearly at the line of fire for each gun as it was laid. There could not have been much reloading or training of the guns, after the first discharge. The only tolerable firing was on the part of Wangtong fort, on the island, from which the Imogene received several shot, one of them coming through the side of the quarter-deck, knocking down and slightly bruising a seaman with the splinters, and grazing the fore part of the mainmast,—a great many more passed between the hammocks and the awning. The whole of the slow-working passage occupied nearly an hour and three quarters, during which the frequent tacks so often exposed H.M. ships to be raked by the batteries, that the little or no damage experienced from the enemy sufficiently demonstrates their want of steadiness and skill. They ought to have sunk both ships. The round stern armaments proved extremely useful. The perfect indifference with which the Louisa cutter was manœuvred through the passage by capt. Elliot sitting upon deck under an umbrella, must have provoked the spleen of the Chinese; for several of their shot struck her, one of them cutting nearly a third through the mast, and another injuring the gunwale of the jolly boat. The lascars behaved extremely well on this occasion, the cutter being, on some tacks, nearly as much exposed to the fire of her friends as of the forts. Soon after having effected the passage and hammered the batteries to their perfect satisfaction, the wind obliged H. M. ships to anchor below Tiger Island.

Perpetual calms or baffling airs kept them at anchor here until the afternoon of the 9th, when they weighed to pass Tiger Island. In the interim, the Chinese were observed very busy in adding to their means of annoyance; a number of boats bringing additional supplies of arms and men, and a parade of some hundred matchlock men took place on the rampart. As the ships got under weigh with a fair breeze, the larboard guns were duly trained and prepared. The battery reserved its fire longer than was expected; but the moment the first shot had passed the ships' bows, a most tremendous and well-directed cannonade was opened from them. The ships steered close under the fort, not more than 200 yards from it, the parapet overlooking them. The crews gave a loud cheer just as they got in front of the battery, and the effect was evident in slackening the enemy's fire. Some grape shot of a rude cast reached the ships in a spent state, which was answered with grape and canister, and the musquetry of the marines and top-men. One of their shot killed the captain of the Imogene's forecastle, and three more were wounded, but not severely. The Andromache had a seaman killed on the maindeck and three wounded. So many thirty-two pounders entered the embrasures, or shattered the stone parapet, that the Chinese loss must have been considerable. A Jos house within the fort was a heap of ruins. This battery got very severely punished, more business having been done in a shorter time than on the former occasion. The ships then anchored below second bar—from want of wind. During these proceedings, all British subjects were unmolested at Canton (except lord Napier and his suite,) being attended by their Chinese servants, and enjoying access to the bazaar as usual.

On the fourteenth of September, lord Napier (who had begun to be indisposed) wrote to Mr Boyd, stating that finding, from the edict of the 11th, that "any further endeavour on his part to urge on the government a more becoming line of conduct would be quite superfluous," and it being stated by the hoppo, in his reply of the 7th, that the trade would be opened as soon as he took his departure for Macao, he requested Mr Boyd to move the proper authorities to order up the British cutter at Whampoa, that he might "carry the same into effect."

The indisposition of his lordship was augmented by the continual worry of negotiations, and the necessary attention to drafting letters and copying chops, rendered unavoidable by the absence of the other superintendents and the secretary. His lordship and suite, in pursuance of arrangements with the Hong merchants, embarked in two chop boats, provided by the government, at 7 P. M. on the 21st of September; and immediately after, the guard of marines (thirteen men) embarked in another chop boat for Whampoa, bearing his lordship's order for the frigates to move out to Lintin. His lordship was obliged to be supported to his boat, through weakness. The *Canton Register* says, that "so far as lord Napier had quitted Canton without being officially recognised by the Chinese government," the result of his proceedings was a failure. It lays the chief blame of this on the dilatory proceedings of the men-of-war's boats; but, as a secondary cause, it mentions "the unpatriotic opposition of a part of the commercial community to lord Napier's measures." "If (reasons the same writer) the forts at the Bogue and Tiger Island had been blown up, the guns thrown into the river, and the frigates had been lightened and warped up the river, lord Napier would have had an interview with the viceroy, and all would have gone on smoothly." This may be doubted. For lord Napier's embarkation at Canton, the Chinese had prepared fire rafts (eight were counted,) which were brought in front of the factories. The river was also defended at Howqua's Fort by three tiers of spars across the river, a passage being left of about thirty feet, which was closed at night by a chain. The lower mouth of the right branch into which the river divides above the raft, was strongly blockaded by piles and sunken junks. The foreign trade was re-opened (except the English) on the 23d of September, and the English trade on the 27th.

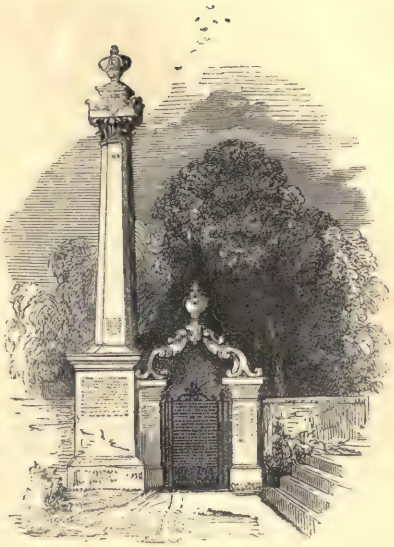
Lord Napier did not reach Macao till the morning of the 28th, having been thus between four and five days on the water, two or three more than necessary. The *Canton Register* states he was detained until his conductors should hear that the frigates had passed out of the river, and that he landed at Macao much weakened by "the barbarous delay and annoyance he met with." It appears that he was surrounded by mandarin boats full of men, the noise of whose gongs prevented rest; that they were compelled to anchor on the 25th for forty hours, gongs being beaten in the mandarin boats and crackers let off night and day, notwithstanding repeated entreaties from his lordship's surgeon; whilst he was tantalised by promises that he should go on, which were not realized. At half-past ten on the night of the 11th of October, 1834, lord Napier expired, being within two days of completing his forty-eighth year. His lordship was buried, at his own request, by the side of his late Chinese secretary, Dr Morrison. His remains, however, have since been brought to Europe, and interred in the family vault in Scotland. Lord Napier married, March 28th, 1816, Elizabeth, only daughter of the late hon. Andrew James Cochrane Johnstone, uncle to the present earl of Dundonald, by whom he had issue six daughters and two sons.

NASH, John, a modern architect of distinction; died May 13, 1835, at his seat, East Cowes Castle, in the Isle of Wight; in his eighty-third year. He was of Welch extraction, and amassed a large fortune as a speculative builder. He was the architect of several important buildings, of which we may name the Haymarket Theatre, the Church of All-Souls in Regent Street, the Church of St Mary, Haggerston, in the parish of Shoreditch, and the new Royal Palace at Pimlico. His Gothic mansion in the Isle of Wight was an early production of its owner. Of his own elegant house in Regent Street, a description and plates will be found in Britton and Pugin's "Public Buildings of London." In his designs for the houses in the Regent's Park and Regent Street, he adopted the idea of uniting several dwellings into a single facade, so as to preserve that degree of continuity essential to architectural importance; and, however open to criticism many of these designs may be, when considered separately, or in detail, he produced a varied succession of architectural scenery, the aggregate effect of which is picturesque and imposing,—certainly superior to that of any other portion of the metropolis. York Terrace, Cumberland Terrace, Hanover Terrace, &c., in the Regent's Park, may be considered a continuation of this design, and, like the street, a great improvement upon the preceding styles of domestic architecture. The architectural taste of Mr Nash has often been questioned as to the elevations of the buildings in Regent Street. The great design for the formation of this magnificent street originated with him; but the designs for the particular buildings were those of the various architects under whose special directions they were built, and with which his only concern was to ascertain that they were properly constructed.

NASMYTH, Alexander, an eminent landscape painter, was born in 1757, at Edinburgh, where he received his elementary education. In his youth he went to London, and became the apprenticed pupil of Allan Ramsay (son of the poet), at that period one of the most esteemed portrait painters of the metropolis. He afterwards visited Italy, where he pursued his studies for several years, in the society of the best Roman artists of the time, and in the fellowship of some contemporary students from England, whose names have since become classic in English art. Having returned to his native city, he commenced practising, with great success, as a portrait painter, and had the honour of pourtraying many of the most distinguished men and women of his time. To his friendship with Burns the world is indebted for the only authentic portrait which exists of the great Scottish poet. His passion for landscape, however, had been gradually gaining ground; and the pleasure he had in executing some of his earlier landscapes, and the applause with which they were received, led him for the most part to abandon portrait, and give himself up to his favourite pursuit. The distinctive characteristics of his chaste and elegant compositions are well known; his industry and popularity have been so unceasing, that there is hardly a mansion-house in England or Scotland, besides more humble domiciles innumerable, on whose walls a production of Nasmyth is not to be found. He took an active interest in all the institutions established in Edinburgh for the promotion of art. He was one of the few distinguished members of the original society of Scottish artists; he was one of the first elected associates of the royal institution, to whose exhibitions he became a principal contributor; and, although his great age at the period of the union of the artists of that body with the royal Scottish academy, prevented his joining their institution, he allowed himself to be named as an honorary member, and ever continued to feel deeply interested in its prosperity. His death took place on the 10th April, 1840, aged eighty-three. Soon after his return from Italy, he married the sister of Sir James Foulis of Woodhall, Colinton, by whom he had a large family, who have all distinguished themselves, more or less, in the arts.

NECROPOLIS, (*a.*) from νεκρος, *dead*, and πολις, *city*, city of the dead, was the name of a suburb of Alexandria, in Egypt, where temples, gardens, and mausoleums were erected, but was also applied to ancient cemeteries in general, and has been in modern days assumed as the designation of several (if they may be so called) *fancy* burying-grounds in our large cities. It is only quite recently that attention has been drawn in this country to the improvement of churchyards, or any endeavour made to render them objects of the picturesque or beautiful; and although it is, perhaps, scarcely to be wished that the stern realities of death should be disguised, by foolish decorations and parade, to the extent to which they are in the celebrated French cemetery of *Père la Chaise*, it is still highly desirable that burying-places should be removed from the hearts of populous towns, and that they should be so constructed as at least not to offend our notion of the repose of the dead, but rather to afford pleasing associations in connection with their memory.

One of the finest modern cemeteries, in point of appropriate situation and embellishment, of which any place can boast, is the **Necropolis** of Glasgow, which the reader will see figured in Plate LXXIII. It is situated at the north-east part of the city, in the vicinity of the cathedral, and forms one side of that ravine on the other side of which the cathedral stands. The ground was purchased by the Merchants'-house of Glasgow about the middle of the seventeenth century, and being calculated for no other immediate use, was laid out as a plantation with Scots firs, elms, planes, and ashes. About the beginning of the present century, most of the old trees were cut down or rooted out, and new ones planted, while a stone wall was erected round the demesne, and a resident keeper placed over the whole. At this time, and up to its recent change to a burying ground, it passed by the name of the Fir Park. We do not positively know to whom belongs the idea of forming the place into a necropolis,* but it was James Ewing, LL.D., and formerly M. P. for the city, who first recommended the matter to the attention of the Merchants'-house. In 1828, a report of a committee on the subject stated, that, "the Fir Park appears admirably adapted for a *Père la Chaise*, which would harmonize beautifully with the adjacent scenery, and constitute a solemn and appropriate appendage to the venerable structure in its front, and which, while it afforded a much wanted accommodation to the higher classes, would at the same time convert an unproductive property into a general and lucrative source of profit to a charitable institution." After receiving, and partially adopting, various plans for converting the park into an ornamental cemetery, it was finally opened for interments in May, 1833. A Jew, it so happened, was the first person buried in this necropolis; and the Jews' place of sepulture, at the northern extremity, is one of the most interesting in the ground. The inclosure contains accommodation for washing the bodies before interment, according to the Jewish law, which law, it may be remembered, also forbids the depositing of one body above another in the same grave. The following cut represents the ornamental column and gate-way of the Jews' burying ground.



On the front of the column are Hebrew initial letters, signifying, "Who among the gods is like unto Jehovah?" and on the pedestal is inscribed one of lord Byron's Hebrew Melodies, the last stanza of which we may quote;

> "Tribes of the wandering foot and weary breast,
> Where shall ye flee away and be at rest?—
> The wild dove hath her nest, the fox his cave,
> Mankind their country—Israel but the grave."

The iron-gate is curious, as having cast into its structure, so as to form a sort of reticulated ornament, the whole of the Scripture paraphrase, "Naked as from the earth we came," &c., which may be read with a little difficulty. A similar curiosity characterizes the gate which leads into the catacombs.

Several years before the Fir Park was converted into a cemetery, a monument was erected on its top to the memory of John Knox. This consists of a huge pedestal and column, surmounted by a statue, and from its elevated site, as well as size, it forms the most prominent, though not the most elegant, feature of the place. Its situation, however, in connection with the cathedral, may be considered appropriate, both by the friends and foes of the great Scottish Reformer. Near it stands a monument to William M'Gavin, (q. v. in the present supplement) who was buried here, and who was one of the most active promoters of the Knox monument. The foundation stone of the monument to Knox was laid, with great ceremony, on the 22d Sept., 1825, amid a large concourse of people. Mr M'Gavin's monument was erected two or three years after his death, which took place in 1832.

In the engraving which we have given of the Glasgow Necropolis, the monument to Knox occupies the summit of the hill; next to it stands an elegant monument erected to the memory of Dr Dick, an eminent clergyman belonging to the Secession church, who was for many years professor of theology to that body of Scottish dissenters, and who died in 1833. Adjoining Dr Dick's monument is Mr M'Gavin's, already mentioned; and farther down is a monument to the memory of Lachlan Lumsden, Esq. a native of the city, who bequeathed £4,000 to the Glasgow Royal Infirmary. The point from which the view of the Necropolis is taken is a little to the north of the road which leads into the cemetery. On the right, a portion of the ancient cathedral of the city is seen (described in the article *Glasgow*, q.v.) The bridge across the ravine was erected expressly as a passage into the Necropolis, no other entrance promising to combine so much beauty with picturesque effect. It is a spacious Roman arch of sixty feet span, from a design by Mr David Hamilton, and is called, somewhat affectedly, "The Bridge of Sighs." The foundation stone was laid, with much solemnity, on the 18th Oct. 1833. At the north-east corner of the bridge is this inscription, from the pen of the then dean of guild, Mr Hutchison: "This bridge was erected by the Merchants' House of Glasgow, to afford a proper entrance to their new cemetery, combining convenient access to the grounds, with suitable decoration to the venerable cathedral and the surrounding scenery; to unite the tombs of many generations who have gone before with the resting-places destined for generations yet unborn; where the ashes of all shall repose until the resurrection of the just, when that, which is sown a natural body, shall be raised a spiritual body,—when this corruptible must put on incorruption,—when this mortal must put on immortality,—when death is swallowed up in victory, A. D. MDCCCXXXIII. Blessed is the man who trusteth in God, and whose hope the Lord is." In the grand façade at the east end of the bridge, which is to be seen in the engraving, is another inscription, composed by Principal Macfarlan, to the following effect: "The Necropolis, or ornamented public cemetery, was constructed by the Merchants'-House of Glasgow, in their property, to supply the accommodation required by a rapidly increasing population, and, by embellishing the place of sepulture, to invest with more soothing associations that affectionate recollection of the departed which is cherished by those who survive. A. D. MDCCCXXXIII. 'Even from the tomb the voice of nature cries.'" The gateway of the façade, like that of the Jews' burying ground, has a scripture paraphrase (the fourth of the Scottish church) interwoven with its rails.

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* Mr Strang, now city chamberlain, was an active promoter of the Necropolis. In 1831, he published a small volume, entitled, "Necropolis Glasguensis; with observations on ancient and modern Tombs and Sepulture." This work, besides advocating the cause of the Necropolis, then in projection, gives a learned and elaborate account of the various modes of ancient and modern sepulture. Into the latter subject we do not here enter, as it is already amply discussed under other heads of the Encyclopedia, such as *Burying Places*, *Cemetery*, *Embalming*, &c.

We cannot, of course, enter here into any detail of the numerous objects of interest which this Necropolis presents. Its highly picturesque situation, overlooking the venerable cathedral and the old surrounding burying-ground, which the author of Waverley has so finely described,—its beautiful walks and carriage-roads,—its botanical curiosities, consisting of ornamental shrubberies, inclosing many rare and interesting plants,—its varied and ever accumulating monuments, forming lanes and streets to which the eye sees no termination,—all must be left to the personal investigation or the fancy of the reader. Only a few years have elapsed since the place was opened, and yet how many have already found in it their last abode—how many honoured names can be already traced among its epitaphs! Every year must add to its melancholy attractions, and the mind gets bewildered in fancying what it may be a century hence. In some beautiful verses by a lady on the Glasgow Necropolis, we find the writer thus prophesying:

"Here may the Bard of Hope[*] repose
The laurel's classic shades among;
And here, when death her strains shall close,
May sleep the Queen of Tragic Song.[†]

"And He,[‡] who late on Scottish lyre
The echoes woke of ancient time,
And sung, to notes of martial fire,
The death-doomed Harold's runic rhyme.

"And other lofty names shall shine
Recorded by their country's pride;
For oft hath genius' light divine
Beamed o'er the City of the Clyde."

NEWFOUNDLAND, (*a.*) Newfoundland isle, lying on the north-east side of the gulf of St Lawrence, between the parallels of 46° 40′ to 59° 31 north latitude, and the meridians of 52° 44′ to 59° 31′ longitude west of Greenwich, is bounded on the whole eastern shore by the Atlantic ocean; on the north-east and north it is separated from the coast of Labrador by the Strait of Belleisle (which is about fifty miles long by twelve broad); on the north-west by the Gulf of St Lawrence, and on the south-west it approaches at Cape Ray towards Breton isle, so as to form the main entrance from the Atlantic Ocean into the Gulf of St Lawrence. Newfoundland is the nearest part of America to Europe, the distance from St John's in Newfoundland, to Port Valentia on the west coast of Ireland, being 1656 miles. Its extreme length measured on a curve from Cape Race to Griguet Bay, is about 420 miles; its widest part, from Cape Ray to Cape Bonavista, is about 300 miles, and excluding its broken and rugged shores, the circumference may be stated at 1000 miles; the whole comprising an area of 36,000 square miles.

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[*] Thomas Campbell, a native of Glasgow.

[†] Joanna Baillie, a native of the district.

[‡] William Motherwell, a native of Glasgow, the author of "Jeannie Morrison" and other beautiful ballads,—in whose case the poet's prophecy has been, alas! too soon fulfilled, for he already lies within the walls of the Necropolis.

Little is known of the interior of this vast island, which stands on an immense bank, in length about 600 miles, with a breadth of about 200 miles, and with soundings varying from twenty-five to ninety-five fathoms; the base being a mass of solid rock, with abrupt fissures, &c. There are apparently two banks, the outer one lies within the parallels of 44° 10′ and 47° 30′ north latitude, and the meridians 44° 15′ and 45° 25′ west longitude, with soundings from 100 to 160 fathoms. This bank appears to be a continuation of the Great Bank, and a succession may be observed the whole way to Nova Scotia. Newfoundland is in shape nearly triangular, the apex thereof being to the northward, and the base extending east and west from Cape Ray to Cape Race. Like the Nova Scotia shores, the coast is every where indented, at intervals of two or three miles, by broad and deep bays, innumerable harbours, coves, creeks, and rivers. The island all round is rocky (with pebbly beaches), generally covered with wood down to the water's edge, and with some lofty headlands on the south-west side.

The climate of Newfoundland varies according to the locale of the island, whether north or south; and the weather, although severe, is less fierce than that of Lower Canada; while, during a long winter, the brilliancy of the Aurora Borealis, and the splendid lustre of the moon and stars, give peculiar beauty to the atmosphere. The most remarkable feature connected with Newfoundland is the fogs on its banks and neighbouring shores.

The fogs of the Gulf of St Lawrence are attributed to the *coldness* of the gulf waters, which is believed to be constant a few feet below the surface as well as at great depths; every gale of wind brings this cold water to the surface, by which the temperature of the air is reduced below the dew point, at which suspended vapours become visible and precipitated. Those on the Banks of Newfoundland are most probably caused by the cold deep water flowing from the Poles to the Equator, being forced to the surface there in consequence of the interruption given by the banks to its course towards the southward. The surface water on the Great Bank is many degrees colder than the surface of the neighbouring sea, and much less than that of the gulf stream, which is within a short distance.

The fogs on the banks of Newfoundland, and even in the Gulf of St Lawrence, are sometimes so dense, that in fine, almost calm weather, with the sun shining over head, two vessels pass each other unseen, while the voices of persons talking can be heard from either ship. The fog appears to lie on the surface of the water, for when near land, an observer from the mast head may descry it quite distinctly, while on deck no object within a few yards distance is visible. The fogs are not generally attended with rain, but the decks are often kept wet, and the higher masts and rigging collect the condensed moisture of the atmosphere in large drops.

In the early part of summer, when the waters have not acquired a temperature approaching that of the air, a peculiar mirage is observable off Newfoundland and in the Gulf of St Lawrence; during its early existence the line of trees with which the hills are covered, seem raised much above the level of the rest, resembling a lofty hedge row; this, however, is soon lost, as all the trees apparently attain the same height, giving the appearance of an immense table, stretching from hill to hill; the shores in the meantime assume the semblance of a great wall, and the island seems girt with a similar inclosure, or bounded with precipices all round; their tops also look flat like tables, and the small islands often assume a flower-pot shape. Dr Kelly observed one instance in the river St Lawrence, where the islands of Bic and Bicquette appeared to join—their wooded tops to meet, leaving an arch, beneath which the waters seemed to flow. On the beach the spray seems to rise in foam to the tops of these imaginary cliffs, while the houses, &c., attain a similar height. Ships, according to their distance, present different elevations, sometimes rising to twice their real height, at others the masts reach only a few feet from the deck; sometimes the upper sails seem double—a second set being seen at a considerable height above the first—while again a second vessel's hull, sails and all, is seen above the first; but in no instance is inversion observed, and the object thus refracted is always visible to the naked eye. The fogs do not appear to be injurious to health. The longevity of the inhabitants is indeed the best proof of the salubrity of Newfoundland; in no country is old age attended with greater bodily vigour and mental animation. There are instances of fishermen 100 years of age being actively employed in the arduous duties of their calling.

An account of the number and description of Vessels employed in the Fisheries of Newfoundland, and of the quantities of Fish and of Oil, the produce thereof; stating likewise the Countries whereto the same was exported during the year ending 30th June, 1832.

Description of Vessels, &c.		Employed in fishing.		
		Num.	Ton.	Men.
Bankers	European	8	497	56
	Island ..	7	470	49
British European vessels on Labrador ..		5	562	59
Vessels from Europe	British ..	414	55278	3230
	Foreign..			
Vessels from the Colonies on the Continent	British ..	285	20083	1176
	Foreign..			
Vessels from the West Indies	British ..	45	4806	320
	Foreign..			
Vessels from Foreign America	British ..	61	6916	397
	Foreign..	3	509	25
Island registered vessels employed sealing	Sealing ..	407	27241	8649
	Labrador and coasting..	274	16432	3171
Number of men employed in the resident shore fishery, including catching and curing		..	..	16273
	Total....	1509	132794	33405
Quintals of fish exported to				
Spain, Portugal and Italy	....quintals	426673		
British Europe	do...	62359		
West Indies	do...	127687		
British America	do...	58585		
Foreign America, North	do...	..		
South	do...	32078		
	Total....	707382		
Tierces of salmon exported to				
British markets	tierces	1383⅓		
Foreign markets	do...	1919		
	Total....	3302⅓		
Barrels of herrings cured		3186		
Quantity of seal oil made	tuns	5933½		
		£ s. d.		
Average prices of	Fish per quintal	0 10 9		
	Salmon, per tierce..	3 2 10		
	Herrings, per barrel	0 11 10		
	Train oil, per tun ..	22 8 10		
	Seal oil, per tun....	23 0 0		

The cod fishery is the most important. The bank or deep sea fishery is now almost abandoned by the English to the Americans and French; the cod found on the outer bank is larger than that obtained in shore, and remarkably well adapted to most of the Spanish and Portuguese markets, but does not look so well when dried. The season commences with April, and ends in October. There are an immense number of boats of different descriptions engaged in the shore fishery; viz. punts, skiffs, jacks, or jackasses, western boats, and shallops, employing from one to seven men each, according to their size, and the distance they may have to sail before they reach their respective fishing grounds. The punts and small boats are generally manned by two persons, and occupied in fishing within a very short distance of the harbour, or circles to which they belong; the skiffs, carrying three or four hands, proceed to more distant stations, sometimes twenty or thirty miles; the western boats are larger than skiffs, and usually fish off Cape St Mary's, off the entrance of a bay so named; the shallops are still larger craft, but now almost obsolete: some of this latter class have been known to admeasure fifty or sixty tons each. The punts and skiffs, constituting what is termed a "Mosquito fleet," start at the earliest dawn of day, and proceed to the fishing grounds, when the cod are expected in great abundance, for at certain seasons they congregate and swim in shoals, and are not unfrequently as capricious in their resort as the winds which are said to influence their movements: these boats generally land their cargoes at the "Stage" at least once a day, usually in the evening, except it be in the height of the season, during capelin time, when they may occasionally load twice a day; the western boats and shallops split and salt their fish aboard, and return to their respective harbours when they may have expended all their salt, or loaded their craft.

The *stage* is erected on posts, and juts out into the sea, far enough to allow the boats to come close to its extremity, for the ready discharge of their cargoes; it is generally covered over, as the rain will injure the fish, and on the same platform is the salt house, with the benches for the *cut-throat*, *header*, *splitter*, and *salter*, the two latter having in point of wages the precedence, and the two former being on a par.

Having thus explained the method of cod-fishing, it remains only to describe the manner of curing. Each salting-house is provided with one or more tables, around which are placed wooden seats and leathern aprons for the cut-throats, headers, and splitters. The fish having been thrown from the boats, a man is generally employed to pitch them with a pike from the stage upon the table before the cut-throat, who rips open the bowels, and, having also nearly severed the head from the body, he passes it along the table to his right-hand neighbour, the header, whose business is to pull off the head, and tear out the entrails; from these he selects the liver, and in some instances the sound. The head and entrails being precipitated through a trunk into a flat-bottomed boat placed under the stage, and taken to the shore for manure; the liver is thrown into a cask exposed to the sun, where it distils into oil,* and the remaining blubber is boiled to procure an oil of inferior quality, and the sounds, if intended for preservation, are salted. After having undergone this operation, the cod is next passed across the table to the splitter, who cuts out the back bone, as low as the navel, in the twinkling of an eye.

With such amazing celerity is the operation of heading, splitting, and salting performed that it is not an unusual thing to see ten codfish decapitated, their entrails thrown into the sea, and their back bones torn out, in the short space of one minute and a half. The splitter receives the highest wages, and holds a rank next to the master of the voyage; but the salter is also a person of great consideration, upon whose skill the chief preservation of the cod depends.

For the next process, the cod are carried in hand-barrows to the salter, by whom they are spread in layers upon the top of each other, with a proper quantity of salt between each layer.

In this state the fish continue for a few days, when they are again taken in barrows to a square flat wooden trough (commonly called the ram's horn), full of holes, which is suspended from the stage head in the sea. The washer stands up to his knees in this trough, and rubs the salt and slime off the cod with a soft mop. The fish are then taken to a convenient spot, and piled up to drain; and the heap thus formed is called "a water horse." On the following day or two the cod are removed to the fish-flakes, where they are spread in the sun to dry; and from thenceforward they are kept constantly turned during the day, and piled up in small heaps called faggots, at night. The upper fish are always laid with their bellies downward, so that the skins of their backs answer the purpose of thatch to keep the lower fish dry.

By degrees the size of these faggots is increased, until at length, instead of small parcels, they assume the form of large circular stacks or piles; and in this state the cod are left for a few days, as the fishermen say, to "sweat." The process of *curing* is now nearly complete, and the fish exposed once or twice to the sun are afterwards stored up in warehouses, lying ready for exportation.

There are three qualities of cured cod-fish in Newfoundland. They are distinguished by the different titles of *merchantable fish*, and West India fish. Merchantable fish are those cured in the best possible manner, and having no apparent defect: Madeira are those having some slight blemish on the face, occasioned by an undue quantity of salt, or being sunburnt; West India having, in addition to the defect of the Madeira, some cracks in the middle, or broken at the fins.

Merchantable fish are generally shipped for the Spanish, Portuguese, Italian, and South American markets. Madeira and West India fish are supplied to the West Indies, and of late years a considerable quantity has been annually exported to the southern and western counties of Ireland. The west of England also consumes no unimportant quantity of salted cod annually.

Another fishery of great importance to the island and to England is that of seals, for the sake of their skins and oil. In round numbers, there were in 1831, seals caught 744,000; in 1832, 538,000; in 1833, 438,000; and in 1834, 401,000.

The fishing or catching of the seals is an extremely hazardous employment; the vessels are from 60 to 150 tons, with crews of from sixteen to thirty men each, provided with fire arms, &c., to kill the seal, and poles to defend their vessels from the pressure of the ice. In the beginning of March, the crews of the vessels in their respective harbours collect on the ice with hatchets, saws, &c., and cut two lines in the frozen surface, wide enough apart to allow their schooners to pass; an operation of great labour, as after the thick flakes have been sawn or cut through they have to be pushed beneath the firm ice with long poles. The vessels then get out to sea if possible through the openings, and work their perilous way to windward of the vast fields of ice, until they arrive at one covered with the animals of which they are in quest, and which is termed a seal meadow; the seals are attacked by the fishers, or more properly speaking, hunters, with fire arms, or generally with short heavy batons, a blow of which on the nose is instantly fatal. The large ones frequently turn on the men,* especially when they have young ones beside them, and the piteous cries and moans of the latter are truly distressing to those who are not accustomed to the immense slaughter which is attended with so great a profit. The skins with the fat surrounding the bodies are stripped off together, the carcases left on the ice, and the pelts or scalps carried to the vessels, whose situation during a tempest is attended with fearful danger; many have been known to be crushed to pieces by the ice closing on them.

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* The livers taken from 300 quintals of cod fish ought to yield a tun of oil, but it sometimes requires more or less, according to the quality of the fish.

NEWPORT; a market-town in Monmouthshire, 147 miles west from London. It is situated on the river Usk, about four miles above its entrance into the Bristol Channel; and over the river is a handsome stone bridge of five arches, that in the centre being seventy-five feet in span, erected in 1800, by David Edward, son of the architect of the famous bridge at Pont-y-Prid, in Glamorganshire. The town is called by the Welsh Castell Newydd, which, as well as its English appellation, has been applied to it in contradistinction from the more ancient town of Caerleon, higher up the river. Leland, in the reign of Henry VIII. mentions it as a town in ruins; but since that period it has become a place of commercial importance, and undergone great improvements, principally within the last half century, having, in consequence of the extension of canal navigation and railroads in its neighbourhood, increased more rapidly than any in South Wales. The river Usk is here navigable for large vessels, there being a rapid and high tide, by means of which they are carried up the stream. The Monmouthshire canal and the Sirhowey railroad furnish communications between this town and the interior; and thus the means are afforded for the prosecution of commerce on an extensive scale. Coal and iron are the principal articles of merchandize exported. The local advantages of the town for ship building, occasions it to be prosecuted to a considerable extent; the river being so situated that vessels of great burthen can be launched from the docks into deep water. Besides iron foundries, here are breweries, rope-works, nail-factories, and an earthenware manufactory. Near the bridge over the Usk are the remains of the ancient castle of Newport, supposed to have been founded by Robert Fitzroy, earl of Gloucester, the natural son of Henry I., who possessed extensive domains in this part of the country, in right of his wife, the heiress of Robert Fitz-Hamon, a Norman baron. This fortress formed a parallelogram, and the walls were constructed of rubble, coigned with hewn stone. Population of Newport in 1831, 5441.

In November, 1839, Newport was the scene of a singular insurrection on the part of the chartists, which was not suppressed without considerable bloodshed. On the 4th of that month, a large body of chartists, many thousands in number, well armed, headed by Mr John Frost, late a magistrate of the place, marched into the town from the hills, and commenced a violent attack on the Westgate hotel, where the magistrates were sitting. After in vain remonstrating with the insurgents, the riot act was read, and the besieged, which fortunately included a party of the 45th foot, were compelled to fire upon the rioters, who fled in all directions, leaving behind them a great quantity of arms, ten or eleven men killed, and from thirty to forty wounded. Several of the special constables and soldiers were wounded, some of them severely. The mayor, T. Philips, Esq. was shot in the arm and hip. But for the firmness and promptitude of the authorities, the town of Newport would have become a heap of ruins. It appears that, according to a preconcerted arrangement, on Saturday night (Nov. 2), the men began their march from the "hills" in the neighbourhood of Merthyr, &c. armed with muskets, pikes, crowbars, pickaxes, &c. dividing into various columns; one to attack Newport, another to keep in check the soldiers stationed at Brecon, while a third marched towards Monmouth to liberate Vincent, their former leader, from the gaol. After which they were unitedly to seize the whole of South Wales. With these purposes their march was continued, the rioters sacking the villages in their route, seizing the provisions, and compelling the whole of the adult male population to join them. At all the iron-works, &c. they blew out the furnaces. At four o'clock on Monday morning they halted in Tredegarpark, the seat of Sir Charles Morgan, bart. where they waited for about two hours for the junction of another division from Pontypool and its neighbourhood. The junction having been made, they formed at about six o'clock into two divisions, and marched into Newport, the one division marching down Stowhill, the other through Charles street, and both joining in the centre of the Main street. On arriving at the Westgate inn, they gave three cheers, and proceeded to attack the house, where they were so effectually checked. Frost and several others were committed to Monmouth gaol, and a special commission was issued for their trial. On the 9th Nov. lord Normanby addressed a letter to the mayor of Newport, expressing her majesty's high approval of the conduct of the magistrates; and on the 13th Nov. his lordship addressed another letter to the mayor, Thomas Phillips, jun. Esq. offering him, with her majesty's gracious sanction, the honour of knighthood.

The special commission for the trial of the chartist rebels of Newport was opened at Monmouth on the 10th of December, the judges being lord chief justice Tindal, Mr Baron Parke, and Mr Justice Williams. On the 12th the grand jury delivered by their foreman, lord Granville Somerset, true bills against John Frost, Charles Waters, James Aust, William Jones, John Lovell, Zephaniah Williams, Jenkin Morgan, Solomon Britton, Edmond Edmonds, Richard Benfield, John Rees, David Jones, George Terner (otherwise Coles) and John Rees, for high treason. In order to comply with the forms customary in trials for high treason, the court was then adjourned to the 31st of December. On that day the proceedings were resumed. The attorney and solicitor-general, serjeants Ludlow and Talfourd, with Messrs Wightman and Talbot, appeared for the crown; and Sir Frederick Pollock, with Mr Kelly and Mr Thomas, for the prisoner Frost. *John Frost* was put to the bar. The whole of the day was occupied in challenging the jury. On Wednesday, Mr Talbot opened the case on the part of the crown; and the attorney-general addressed the court and jury. After which Sir Frederick Pollock objected to the calling of the witnesses, in consequence of the list of them not having been given to the prisoner, Frost, agreeably to the terms of the statute. Mr Kelly followed on the same side, and the attorney-general was heard in reply. The chief justice Tindal decided that the trial should proceed, and the opinion of the judges be taken, in the event of the result of the trial making such reference necessary. On the third day the evidence was entered into; and on the eighth day (Jan. 8,) after the most patient attention of the court and the jury to the laborious and eloquent addresses of the counsel, and to the immense mass of evidence, the learned chief justice summed up in a very clear, able, and impartial address to the jury, who retired for half an hour, and then returned a verdict of *Guilty* against Frost, with a strong recommendation to mercy. *Zephaniah Williams* was then placed at the bar. His trial occupied four days: and Mr Thomas conducted his defence. The jury returned a verdict of Guilty, with a recommendation to mercy as before. *William Jones*, watchmaker, was put to the bar. Mr Richards conducted the prisoner's case, and the trial was concluded on Wednesday Jan. 16. A verdict of guilty with a recommendation to mercy, was also returned in this case. Charles Walters, Jenkins Morgan, John Rees, Richard Benfield, and John Lovell, were then placed at the bar; and having been allowed to withdraw their plea of not Guilty, they then pleaded Guilty. Upon them also sentence of death was passed, the court intimating that they would be transported for life. Four were discharged, the attorney-general declining to proceed against them. Two forfeited their bail; and nine, having pleaded Guilty to charges of conspiracy and riot, were sentenced to terms of imprisonment not exceeding one year. On the 25th Jan. the objection raised by Sir Frederick Pollock was argued before the fifteen judges in the court of exchequer; when the attorney-general, the solicitor-general, Mr serjeant Ludlow, and Mr serjeant Talfourd, appeared as counsel for the crown; and Sir F. Pollock, Mr F. Kelly, and Sir W. Follet for the prisoners. The arguments were continued on Monday the 27th, and Tuesday the 28th, when the judges decided against the objection by a majority of nine to six. The royal mercy was, however, eventually extended to Frost, Williams, and Jones, whose sentence of death was commuted to transportation for life.

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* The hooded seals sometimes draw their hoods, which are shot-proof, over their heads.

NEWPORT; a town in the Isle of Wight, seventy-nine miles from London. It is situated nearly in the centre of the island, on the river Medina, which falls into the sea seven miles below the town, and consists of five parallel streets, running east and west, and crossed by three others, at right angles, at the intersections of which are three large squares, serving for the cattle, corn, and poultry markets. Most of the agricultural produce of the island is sold at these markets, which are held on Wednesdays and Saturdays. The church, which is dedicated to St Thomas-à-Becket, is situated in the centre of one of the squares, and is a spacious edifice, consisting of three aisles of equal length, separated from each other by pointed arches, and an embattled tower at the west end. About a mile from the town is Carisbrook castle (which see, in the present Supplement) memorable as a place of confinement for Charles I. Population of Newport in 1841, 3858.

NEW RED SANDSTONE, or variegated sandstone, lies above the coal measures, but with its strata in an unconformable position to those on which it is placed. In appearance this sandstone is of a deeper red than the general hue of that of the coal measures, and also of a more friable porous consistence, and is altogether evidently a different deposit. In England the new red sandstone commences at Tynemouth, and extends in a southwesterly direction as far as Cheltenham, covering the surface of the counties of Durham, York, Nottingham, Stafford, Warwick, Cheshire, and Shropshire. In it both animal and vegetable petrifactions occur, though sparingly; it also contains beds of gypsum and rock salt. It consists of subordinate formations, which may be divided into upper, middle and lower beds. The lower beds consist of a coarse conglomerate cemented by a ferruginous sand or marl, the middle beds of magnesian limestone, and the upper of sandstone or marl. In these upper beds are found gypsum or sulphate of lime, and rock salt. The valuable material of muriate of soda, or common salt, is found in considerable quantity dissolved in the waters of the ocean; also, in salt springs issuing from the earth in various kinds of strata, and in beds or masses sometimes of immense extent in this new red sandstone. Various opinions are entertained regarding the original production of such beds. By some it is supposed, that the salt has been deposited by the gradual evaporation of inland salt lakes, the muriate of soda, the least soluble of the salts, being first precipitated, while the other salts that are more easily soluble in smaller proportions of water have been drained off, thus leaving a bed of pure salt. Others again have conjectured, that salt is a chemical production, formed by the decomposition of granite and other rocks containing a large proportion of soda. Rock salt, when dug from the pit, has a reddish hue, being tinged by iron and other impurities, from which it is freed by repeated solution and crystallization. Rock salt is found in England at Norwich, in Cheshire, and Droitwich in Worcestershire, besides several salt springs in the northern counties, and in Leicestershire; in France, in the salt springs of Salins; in Switzerland, Spain, Hungary, Poland, and various other places on the continent of Europe. It is abundant in the deserts of Caramania in Asia; in the table land of Tartary; in Thibet and Hindostan; in Caffraria, near the Cape of Good Hope, and in both North and South America. Rock salt has also been discovered in New South Wales, so that this important substance seems universally diffused over the globe. The salt district in Cordova in Spain comprehends the hills on which the town is situated, and the environs for several miles. The surface is almost every where covered with vegetable soil to the depth of six inches or more, which renders it productive. The rocks of salt form a valley, a mile in length, and half a mile in breadth.

The principal of these rocks is 663 feet in height, and 1220 feet in diameter at its base. A chain of hills of salt traverses the whole valley. The mountain of red salt is so called, because that colour predominates, but the colours vary with the altitude of the sun and the moisture of the air. A little stream runs through the valley. All these mountains contain crevices, and chasms having spacious grottoes, where various shaped stalactites of salt hang from the roofs. Nothing can compare with the magnificence of the spectacle which the mountain of Cordova exhibits at sunrise. Besides the beautiful forms which it presents, it appears to rise above the river like a mountain of precious gems, displaying the various colours produced by the refraction of the solar rays through a prism. The salt mines of Wieliczka, near Cracovia, in Poland, are the most extensive and most celebrated in Europe. They are worked at the depth of 750 feet. The mine extends under ground for upwards of a league. It has numerous galleries, and a whole village, containing many workmen, with their families, horses, waggons, &c. It is remarkable that in these mines of rock salt, there are springs of fresh as well as salt water. In the new red sandstone of Massachusetts, North America, numerous impressions of the foot marks of several species of birds have been lately discovered by professor Hitchcock. This sandstone covers a large extent of country, and in its present position lies inclined, at an angle of thirty to forty degrees; but when impressed by the feet of those birds, it must have been horizontal, and have formed the soft and yielding sands of some bay or estuary. These impressions have been called Ornithichnites, or stony bird tracts. (See a full description of them, under the head, *Ornithychnology*, in the present Supplement.) Impressions of the footmarks of animals have also been discovered in Scotland, in some quarries in Dumfriesshire, also of the new red sandstone. These impressions show distinctly the flat foot of an animal with claws, and they have been conjectured to be of the class Reptilia, most probably tortoises or lizards, or perhaps both. From the regular succession of hind footmarks coming almost close upon the fore feet, there can be no doubt but that the animal was a quadruped. On some of the slabs, the appearance of scratching, or slipping, is evident in the impressions, as if the animal had been scrambling up an inclined plane.

NEWTON, Gilbert Stuart, R.A.; an eminent painter, was born in Halifax, Nova Scotia, on the 20th of September, 1794, and was the twelfth and youngest son of the hon. Henry Newton, collector of his Majesty's customs in that province. On his first arrival in Europe, he visited Italy, and on his removal to this country entered himself a student of the Royal Academy. The first works by which he became extensively known, were his "Forsaken" and his "Lovers' Quarrel," engraved in the "Literary Souvenir" of 1826; his "Prince of Spain's Visit to Catalina," engraved for the same work in 1831, and painted for the duke of Bedford; and a scene from the "Vicar of Wakefield." Though Newton acquired skill both in drawing and in colour, and became acquainted with the fine proportions and harmonious unities of the antique, he was more remarkable for delineations in which beau-ideal drawing had little to do, but expression every thing. He had less inclination for the stern and the severe, than for the soft, the gentle, and the affecting. His favourite model for imitation was Watteau. He contented himself with painting small pictures; and the subjects which he embodied were either drawn from nature around him, or found in the pages of our novelists and poets. To enumerate all his pictures would be difficult, but the names of a few of them will be sufficient to awaken pleasing recollections: 1. "Portia and Bassanio," from the Merchant of Venice; 2. "Lear attended by Cordelia and the Physician;" 3. "Lady Mary Fox;" 4. "Abelard;" 5. "Jessica and Shylock;" 6. "The Vicar of Wakefield restoring his Daughter to her Mother;" 7. "Sir Walter Scott." His happiest works are of a domestic and poetic kind; he loved to seek expression in a living face, and, moulding it to his will, unite it to a fancy all his own: some of his single figures, particularly females, are equal in sentiment and colour to anything in modern art. They are stamped with innocence as well as beauty. He was a slow workman, and accomplished all by long study and repeated touches. He sometimes received high prices for his works. The duke of Bedford gave him 500 guineas for the "Prince of Spain's Visit to Catalina," and lord Lansdowne paid him 500 guineas for his "Macheath."

About 1832, he visited America, where he married a young lady of considerable personal attractions. He was elected a royal academician in 1834. Shortly after his return to England he exhibited unequivocal signs of insanity, which increased until it became necessary to send him from home. Four days before his decease he recovered the exercise of his reason, spoke of his approaching end with calmness and resignation, and exhausted nature finally sunk into the sleep of death without a struggle or sigh. He died at Chelsea, on the 5th Aug. 1835, aged forty. His remains were interred in Wimbledon churchyard on the 13th of August. Mr Newton was tall and well proportioned, and somewhat affected in his manner; but a perfect gentleman, and a very respectable scholar.

NEW YORK, (*a*.) By the census of 1835 the population of New York was 270,089. In 1825 it was 166,086, and in 1830, 202,589; the increase in these intervals of five years being respectively at the rate of 22 and 33 per cent. At the mean rate of increase the population at present (1840) must amount to above 350,000, thus doubling within the term of *fourteen* years.

The following table shows various particulars of the population, and the number of marriages and births in the year preceding the census.

Population of the City of New York, 1835.

		Per Cent.			Per Cent.
Males	131,624	48·73	Whites	254,892	94·4
Females	138,465	51·27	People of Colour,	15,197	5·6
	270,089	100·		270,089	100·

Males subject to military duty	23,658 or 1 in 11·4 of population.	
— entitled to Vote	43,091 or 1 in 6·2 —	
— Aliens*	27,669 or 1 in 10· —	
Females, Married. under 45	39,975 or 28·87 per cent.	Of Total No. of Females.
— Unmarried, between 16 & 45,	35,697 or 25·78 —	
— — under 16	46,508 or 33·58 —	
— Married and Unmarried, above 45	16,290 or 11·77 —	
Persons of Colour not taxed	14,977	
— — taxed	152	
— — entitled to Vote	68	
Paupers	1,799 or 1 in 150 of population.	
Deaf and Dumb	175 or 1 in 1,543 —	
Blind	105 or 1 in 2,572 —	
Idiots	32 or 1 in 8,440 —	
Lunatics	32 or 1 in 8,440 —	

* Female aliens were omitted in the census of 1835, but are estimated at about 27,000, which would make the total number of aliens one-fifth of the population.

Marriages during the preceding year	1,990 or 1 to 136 of population.	
Births during the preceding year, Males	4,528 or 50·53 per cent.	
— — Females	4,432 or 49·7 —	
Total . .	8,960 or 1 in 30·14 of population.	
The Deaths in New York, in 1837, amounted to, Males,	4,712 or 53·96 per c.	
— — Females	4,020 or 46·04 —	
Total, including 550 still born and premature	8,732	100·
In 1836 the Deaths, including 506 still-born, &c., were	8,009	

The rate of mortality, according to the population (still-born excluded) has been—

	population	deaths	or 1 to
In 1805	75,770	2,297	32·98
1810	96,373	2,073	46·49
1815	100,619	2,405	41·83
1820	123,706	3,326	37·19
1825	166,086	4,774	34 78
1830	197,112*	5,198	37·92
1835	270,089	6,608	40·87

The mean average duration of life, in New York, is estimated to have been 25·45 years, between 1830 and 1835, inclusive; and only 22·05 years in 1836.

Places of Nativity of those who died in 1836 *and* 1837.

	1836	1837	Total.	Per Cent
England and Wales	320	307	627	3·74
Ireland	1,378	1,206	2,584	15 43
Scotland	99	74	173	1·03
Total of Great Britain and Ireland	1,797	1,587	3,384	20·20
Germany	213	198	411	2·46
Other European Countries	103	84	187	1·12
British America and West Indies	21	30	51	0·40
South America, Africa, and Asia	3	6	9	
At Sea	3	3	6	
Unknown	148	184	332	1.98
Total Foreign States	2,288	2,092	4,380	26·16
The United States	5,721	6,640	12,361	73 84
Total	8,009	8,732	16,741	100·00

In June 1837, the whole number of paupers in the alms-house, hospital, and Long Island farms, was 2,453, including 871 children, chiefly American. In the penitentiary and bridewell were 335 male prisoners, and 286 females, white and coloured, making a total of 3,074 paupers and prisoners under the care of the commissioners of the alms-house; or, deducting the children, 2,203. In September 1837, the total number was 3,332, of whom 2,045 were foreigners, and 1,287 native Americans. In the year ending the 10th September 1837, an increase had taken place of 1,005 inmates, of whom 887 were foreigners. Of the 1,209 patients treated in the hospital in 1837, 982 were aliens, and only 227 were born in America. Scarcely a vessel arrives from certain ports of Europe with steerage passengers which does not increase the applicants for admission into the alms-house.

The arrivals from foreign ports at the port of New York were, in—

	1835.	1836.
American vessels	1,565	1,583
English	287	366
Other nations	192	344
Total	2,044	2,293

The coasting arrivals are between 4,000 and 5,000 per annum.

The number of passengers that arrived at New York from foreign countries, in the six years 1831–36, was 266,494; or, on the average, 44,415 per annum. In the year 1836 they amounted to 60,540; and the number is stated to have increased greatly in the season of 1837, the average being nearly 2,000 per week.

In 1791, the exports from New York to foreign ports, amounted to £563,730. In the year ended the 1st of October 1835, they were as follows·—

Domestic Produce.—In American vessels	£4,303,465		
In foreign —	580,805	4,884,270	
Foreign Producc.—In American vessels	£1,481,620		
In foreign —	461,794	1,943,414	
		£6,827,684	

The value of the Imports in the same year was—

In American vessels	£18,626,278
In foreign —	1,216,765
	£19,843,043

In 1832, the customs' revenue on imports into New York amounted to £2,925,000, while the total customs' revenue of the United States has seldom exceeded £4,950,000. In 1834, the total tonnage of New York, registered, enrolled, and licensed, was 359,222 tons, or upwards of one-fifth of the whole tonnage of the United States. The number of vessels in port, in the busy season of the year, varies from 600 to 700, exclusive of above fifty steamers.

During the thirty-six years to 31st December 1832, 47,744 patients were admitted into the New York hospital, whose nativity is recorded as follows. The table is interesting, as showing the tendency of emigration from differents parts of the Old World into the New, up to the period to which the table extends.

Natives of the United States		25,727	or 53 9 per c.
— England	3,645		
— Wales	111		
— Scotland	1,271		
— Ireland	11,524	16,551	— 34.7 —
— The West Indies		713	— 1·5 —
— Nova Scotia		28	— 0·2 —
— The Ocean		47	
— Africa		260	— 0·5 —
— The East Indies		190	— 0·4 —
— Germany	1,025		
— Holland	345		
— Prussia	230	1,600	— 3 3 —
— Denmark	260		
— Norway	200		
— Finland, 5; Sweden, 708 =	713	1,173	— 2 4 —
— Russia, 65; Poland, 13 =		78	— 0·2 —
— France, 724; Switzerland, 20 =		744	— 1·6 —
— Italy, 204; Sicily, 20 =		224	— 0·5 —
— Spain, 155; Portugal, 254 =		409	— 0 8 —
Total		47,744	100·

The great difference in the social condition of native Americans and of the emigrants, particularly Irish, who flock to New York, is distinctly shown by the following statement of the birth-places of the patients admitted to the Bellevue hospital in 1836:—

Americans		227
Irish	741	
English and Welch	122	
Scotch	22	885
Germans	51	
Other Europeans	31	82
Mexicans, West Indians, & Nova Scotians		15
Total		1,209

NIMMO, Alexander, F.R.S.E., and M R.I.A.; an eminent civil engineer, was born at Kirkaldy, in Fifeshire, in 1783. His father, although he latterly kept a hardware store, was originally a watchmaker. The son was educated at the grammar school of Kirkaldy; afterwards studied for two years at the college of St Andrew's, and finally completed his studies at the college of Edinburgh. He was an excellent Greek and Latin scholar; and the higher branches of mathematics and algebra were his favourite studies. At the age of nineteen he was appointed rector of the Inverness academy, by the unanimous vote of the proprietors, after a severe contest with other candidates of no ordinary attainments, during an examination of three days. Whilst occupying this office, he was first employed in a public capacity, at the recommendation of Mr Telford, by the parliamentary commissioners for fixing and determining the boundaries of the Scottish counties. This undertaking he accomplished during the vacations, and performed it in the most able and satisfactory manner. His report, which is of considerable magnitude, is one of the most interesting documents ever published in that form. Shortly after this performance, he was again recommended by Mr Telford to the commissioners for reclaiming the bogs of Ireland. In this situation he became well acquainted with the habits and wants of the Irish peasantry, and his reports and maps of the Irish bogs were in the highest degree creditable to him. After completing the bog surveys, Mr Nimmo went to France, Germany, and Holland, and personally inspected the great works of those nations. On his return he was employed in the construction of Dunmore harbour,—a work of immense magnitude and utility, on a shore much exposed to the roll of the Atlantic, and where the depth of water at the extremity of the pier exceeds that of the Plymouth Breakwater. Mr Nimmo was employed by the Fishery Board in making surveys of the harbours of Ireland, and constructing harbours and piers all round the coast. He was also employed by the Ballast Board to make a chart of the whole coast, which was executed with great skill and accuracy. He likewise compiled a book of sailing directions of St George's Channel and the Irish coast. During the great distress in the year 1822, he was appointed engineer to the "Western District" of Ireland; and from the outlay of £167,000, up to 1830, he caused, by the improvement of land and the formation of what may be termed new settlements, no less an increase of revenue in that district than £106,000 per annum. In reviewing Mr Nimmo's professional practice, its extent and variety are calculated to excite surprise. Upwards of thirty piers or harbours on the Irish coast were built under his direction; also Perth Cawl in South Wales; he designed the Wellesley bridge and docks, at Limerick; and latterly was engaged in Lancashire, projecting a railway from Liverpool to Leeds, and also the Manchester, Bolton, and Bury railway. He was consulting engineer to the Duchy of Lancaster, the Mersey and Irwell navigation, the St Helen's and Runcorn Gap railway, the Preston and Wigan railway, and Birkenhead and Chester railway. In addition to his classical and mathematical knowledge, he was well versed in modern languages, particularly French, German, Dutch, and Italian, and was also well acquainted with practical astronomy, chemistry, and geology. To the last named science he was much attached, and wrote an excellent paper, showing how it might become available in navigation, which was published in the Transactions of the Royal Irish Academy. He was also the author of the article on Inland Navigation in Brewster's Cyclopædia; also, in conjunction with Mr Telford, of that on Bridges, and with Mr Nicholson, of that on Carpentry. Besides these, he wrote several papers for various periodicals. His evidence on the trial, which took place between the corporation of Liverpool and the Mersey Company, is highly interesting to engineers and practical mathematicians. Lord Brougham was the counsel by whom Mr Nimmo was cross-examined; and the latter was undoubtedly the only engineer of the age who could at all have competed with his lordship's knowledge of the higher mathematics and natural philosophy, on which the whole subject in dispute depended. Mr Nimmo's death took place at Dublin, on the 20th Jan. 1832, aged 49.

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* In another document the population in 1830 is stated at 202,589.

NODULE; a round irregular shaped mass, from *nodus*, a knot. Various mineral substances are found of this shape, as flints, iron-stone, and calcareous and argillaceous nodules. The nuclei of all these is generally some organized substance, as a piece of sponge, a shell, a leaf, a fish, or the excrement of fishes or other animals called *coprolites*. These nodules appear to be formed around the central substance, by some chemical affinity between the earths or metallic matters and the decomposing animal or vegetable body. Flint nodules are very common in chalk, exhibiting a proof of the existence of quartz, in a fluid state, at the period of their formation. Ironstone nodules also abound in the coal measures, and in the old red sandstone. Calcareous nodules, inclosing fishes, are by no means uncommon in certain localities.

NORTH AMERICA, *(a.)* In the year 1837, a work was published at Copenhagen, by the Royal Society of Northern Antiquaries, in which incontestible evidence is adduced, founded on ancient Icelandic MSS., to prove that portions of North America were known to the Scandinavians five hundred years before Columbus. Traditions to this effect had long existed; but although the fact could not, or should not, tarnish the true glory of Columbus, who did not, like the Northmen, stumble upon a new world by accident, *but who went to seek, and found one*, still the general inclination of the popular mind, in the reading community, was against the reality of this Scandinavian discovery of America. Washington Irving expresses himself with distrust on the subject, although he admits that there is no great improbability, "that such enterprising and roving voyagers as the Scandinavians may have wandered to the northern shores of America, about the coast of Labrador, or the shores of Newfoundland." Messrs. Leslie, Jameson, and Murray, in their "Discovery and Adventures in the Polar Seas and Regions," reject the opinion of a visit to any part of the American coast by the Norwegians. They explain the traditions on the hypothesis, that the first discoveries of Greenland, made by the Norwegians, were in a high northern latitude, and that Vinland (the name bestowed on the discovered land) was but another and a more southern portion of the same territory. On the other hand, M. Malte-Brun entertains no doubt on the subject. After giving a brief abstract of the tradition, he adds, "to entertain a doubt of the truth of accounts so simple and probable would be an excess of scepticism; and if we admit them, it is in vain to look for Vinland, except on the coast of North America. That part of the world, then, was discovered by Europeans, five centuries before Columbus; and this discovery, the first of which there is historical proof, was not perhaps wholly unknown to the bold and skilful Genoese, who first succeeded in opening a continuous communication between the two hemispheres." M. de Humboldt, after repeating the purport of the traditions of a Norwegian discovery, with an expression of entire reliance on their general accuracy, judiciously adds: "In this class of events, as in others of a more remote antiquity, we know, so to say, the masses;—the reality of the communications between Greenland and the American continent; but the detail of the events is vague, and often in appearance extraordinary. It is only the learned of Denmark and Norway, who can remove those contradictions of dates and distances, those doubts on the direction and length of the voyages, which present themselves on the face of the spots, described in the *Sagas*." M. de Humboldt distinctly rejects the opinion that Vinland was the southern part of Greenland, which appears to have originated with Zurla; and adds, that "the colonization of this peninsula did not proceed from north to south."

Among the questions to which an answer was necessary before the truth of this tradition could be admitted, were those which relate to the Icelandic manuscripts, in which the tradition is contained. What are these manuscripts, where are they preserved, what is their age, and what their claims to authenticity, what is their exact purport, and why are they not published? A want of information on these points, was probably a chief cause of the distrust and doubts entertained on this interesting subject.

Full satisfaction on all these points, as far as it is possible to furnish it, will be found in the volume referred to.[*] It presents us with extracts from no less than eighteen ancient authors principally Icelandic; several, containing detailed accounts of the discovery, and all of them allusions to it. Satisfactory information of the genuineness of the manuscripts will also be found in the work, and the question will be found to reduce itself to a pretty simple issue on the credibility of the accounts themselves. Something of the reluctance to admit this discovery which haunts the popular mind, unquestionably springs from a superficial notion of the improbability that a people, locked up, as we almost think them, within the ice-bergs of the north, should have preceded the Genoese, the Venetians, the Spaniards, and Portuguese, in crossing the Atlantic. It happens, however, that at the very period when this discovery is alleged to have been made by the Northmen, and long before, they were, of all the tribes of men, precisely the people most likely to make it. Out of a little speck of a barbarous horde, not important enough to be named by Tacitus in his account of the Germans, there had sprung up, in the course of a few centuries, that bold, enterprising, warlike race, who, under a strange political organization, in which feudalism, traffic, knight-errantry, and piracy bore equal parts, covered the ocean with their commercial and their naval marine, discovered or colonized, or both, the archipelago of the North, Iceland, and Greenland, the Orkneys, the Shetland Islands, Ireland, and the main of England; all littoral Germany, the Low Countries, and the northern coast of France; ravaged the coasts of Spain and France on the Mediterranean; sacked the cities of Tuscany; wrested Apulia from the Greek emperors; made successful war with the pope and the emperor; established one dynasty in Muscovy; drove the Saracens out of Sicily, and established another dynasty there; defeated, in Epirus, the last powerful armies which were raised by the degenerate empire of the East; overran Greece, and carried terror to the walls of Constantinople. Naval skill, experience, and power, were the foundation of this ubiquitous domination. The vessels of the Northmen were substantially built of the most durable timber; were constructed with covered decks; and their mariners were the first who learned the art of sailing on a wind. The sea was their home. When the head of a family died, it is said that his sons cast lots for the inheritance. He that gained the lot occupied the paternal estate; for the rest of the sons,

> "Their march was on the mountain wave,
> Their home was on the deep."

They were among the last of the inhabitants of Europe who embraced the Christian religion; and their barbarous faith, their ruthless mode of warfare, and their professed contempt of the laws of nations, which were respected by the population of Christendom, made the names of the Vikingars terrible in the ears of the civilized world. The period assigned for the discovery of the American coast, by their navigators, was perhaps that at which their power was at its height of developement. The cold and cheerless sea which stretches from the Arctic coast of America to Norway, and the entire expanse of the Atlantic, with its encompassed islands down to the Azores, was one great theatre of their activity. The discovery of America is supposed to have taken place in the year 1000. This was but a century after Rollo made the conquest of Normandy; in 1060, we find one Norman prince established in Apulia; and six years after, another conquers England, and founds the present line of British sovereigns. It is plain that no achievement of naval adventure, related of such a people, can be considered beyond the line of probability.

The Northmen, though before their conversion to Christianity a barbarous, were by no means an illiterate people; and after their conversion, and adoption of the alphabet of the Christian nations, they became rapidly a reading and a writing people. They were not, indeed, unacquainted with letters, before they were taught the Roman alphabet by the priests; but it does not appear that the ancient Runic characters were used for any other purpose than inscriptions. But a strong poetical taste and a passion for traditionary and mythical lore, pervaded the northern race. The order of Skalds, or poets, was the immediate depository of the national traditions. They were treated with great consideration, both on account of their office and their rank, for they were of the noble and powerful families. Those of the class who distinguished themselves for their genius, became the friends and confidential advisers of the kings and earls. They were entertained at court in time of peace; and in battle were stationed where they could witness the exploits which they were to commemorate; in other words, they had the privilege of a position in the hottest of the battle. The existence of this class of men gave a peculiar character to the literature of the North. In the south of Europe, at this period, literature was almost a monopoly of the clergy, and every thing was written in the Latin language. As necessary consequences, most of the writings of that day abound in monkish legends;

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[*] The *Latin* title of the work is, *Antiquitates Americanæ, sive Scriptores Septentrionales rerum Ante-Columbranarum in America.* Mr C. C. Rafn, Secretary to the Northern Antiquaries, was editor.

and what was still more unfavourable to the growth of a vernacular literature, they were a dead letter to the mass of the people. The Skalds were men of the world;—warriors, rovers, chieftains, they mingled in the stir of life; they were trained, not within the cloister, but in the open air of the mountains and the vales, and amidst the wild creations of Arctic nature. After the convulsions of continental Scandinavia, Iceland was their favourite seat, the home of stout-hearted refugees, who made this poor frozen rock the abode of traditionary lore and song. Nature, with a kind of caprice, in reproducing in the polar circle an Ausonian age, associated with it the romantic features of a Campanian region. Volcanoes flamed up from eternal glaciers; and fountains of boiling water spouted from snow-clad craters. The conversion of the North to Christianity was contemporary with the period to which the discovery of America is referred; and with this period commences also the reduction to writing of the mythical and traditionary lore of the Skalds. In 1056, Sæmund Sigfussen was born. The poetic, or elder Edda, was reduced by him to writing,—a collection of the mythological and historical traditions of the North. Ari the Wise was his friend and fellow-student. He composed several works, of some of which fragments are still extant. His accounts extend from the latter part of the ninth century to the beginning of the twelfth, and include the most remarkable events connected with the first settlement of Iceland, the revolutions in its government, the discovery of Greenland, and the introduction of Christianity. A work of this writer, called Landnama-Bok, contains a passage relative to the discovery of Greenland. In the next century, (in the year 1178,) Snorre Sturleson was born, whose great national history, *the Heimskringla*, is still preserved. It will appear from this brief sketch, that, at the very period at which the discovery of America is alleged to have been made by the Northmen, they were rapidly becoming a literary people; and that with the third generation from the discoverers, a series of national writers of reputation commences, whose works are still preserved, and form a satisfactory basis of authentic history.

In the spring of the year 986, Eric Rauda, that is, Eric the Red, emigrated from Iceland to Greenland, and formed a settlement there called Brattalid, at a place named from himself Ericsfiord. Among those who accompanied him was Heriulf Bardson, who established himself at a place which still bears the name of Heriulfsness. Heriulf had a son named Biarne, Biorne, or (in some modern writers) Biron. Biarne was absent on a trading voyage in Norway, when his father accompanied Eric to Greenland. Returning to Iceland in the course of the summer, and finding his father gone, he sailed in pursuit of him, though wholly ignorant of the navigation between Greenland and Iceland. His vessel was soon enveloped in fogs; and after many days' sailing, he knew not whither he had been carried. When the fog cleared up, they found themselves sailing with a south-west wind, and saw land to the left. It was without mountains, overgrown with woods, and rose in several gentle elevations. As it did not correspond with the descriptions of Greenland, the country of which they were in search, they left it to larboard, and continued sailing for two days, when they saw another land, which was flat and overgrown with wood. From thence they stood out to sea, and sailed three days with a southwest wind, when they saw a third land, which was high and mountainous, and covered with glaciers. Coasting along its shore, they discovered that it was an island. They bore away from it without landing, and after four days' sailing with fresh gales, reached Heriulfsness in Greenland. Such is the tradition of Biarne's voyage in 986. If it be considered as authentic, we must suppose, that on sailing from Iceland for Greenland, he was carried by a northeast wind and currents far to the south, till he struck the coast of America; and thence, with an opposite wind, stretched along the shores of Newfoundland and Labrador, till he reached his place of destination in Greenland. Biarne is stated not to have landed on the continent of America.

Some time after this, probably in 994, Biarne made a visit to Eric, earl of Norway; and gave him an account of his voyage, and of the unknown land he had seen. He was censured by the earl for not having explored the region. On his return to Greenland, a voyage of exploration was determined upon. Leif, a son of Eric the Red, for this purpose bought Biarne's ship, and put on board a crew of twenty-five men, among whom was a German named Tyrker, who had been long attached to the family of Eric. They sailed in the year 1000, and came first to the land which had been last discovered by Biarne. Here they landed. No grass was visible; the shore was lined with icebergs; and the intermediate space between them and the water, was one continuous stratum of slate. This substance is called *Hella* in the Icelandic tongue, and hence the region was named Helluland. In the Copenhagen publication this is supposed to have been Newfoundland, on the ground of the length of time,—four days,—passed by Biarne in the first-named voyage, in sailing from this spot to Greenland; but the described features of the country correspond more nearly with those of Labrador.

They put out to sea from Helluland, and descried another land, where they also went on shore. It was level, covered with wood, and presented a front of white sand bluffs. This they called Markland, or Woodland. This is supposed to have been the coast of Nova Scotia. Again, standing out to sea, they sailed for two days, with a northeast wind, before they saw land again. They then came to an island east of the main, and entered a channel between this island and a promontory projecting in an easterly (or northerly) direction from the main land. They sailed westward; there was much land left dry at ebb-tide. Afterwards they went on shore at a place, where a river, issuing from a lake, fell into the sea. They brought their ship into the river,—thence into the lake,—and there anchored. Here they first constructed temporary huts; but having determined to pass the winter, they erected more permanent buildings, which they called Leifsbuthir, Leif's booths, or huts. Thus established, Leif divided his company into two parties, whose business it was, alternately to watch the settlements, and to explore the country. Upon one occasion the German, Tyrker, failed to return at night, with the exploring party to which he was attached. When at length he came back, he reported that, in his wanderings, he had seen abundance of grapes, with which he was well acquainted in his native land. From this circumstance Leif gave the name of Vinland, or Wineland, to the country. After passing the winter at this spot, Leif and his party returned to Greenland in the spring. The island just alluded to is supposed to have been Nantucket, and the region called Vinland the States of Massachusetts and Rhode Island.

On his return to Greenland, Leif's discovery was the object of much inquiry; and Thorwald, his brother, borrowing Leif's vessel, undertook another voyage in the same direction, in the year 1002, determined to explore the country further in a southern direction. They reached Vinland before winter, which they passed at Leif's booths, employing themselves in fishing. In the spring of 1003, a party was sent by Thorwald, in the ship's long boat, to explore the country to the south. They passed the summer in this employment, and found the country beautiful and well wooded, with a narrow belt of sand between the forest and the sea. They also encountered many shallows and islands. They found no traces of men, except a shed upon an island lying to the westward.

In the spring of 1004, Thorwald sailed out to the eastward, in the large ship, and then northward past a remarkable headland, enclosing a bay, and which was opposite to another headland. They called this Cape Kiarlaness, or the Keel-Cape. Doubling this cape, they skirted the shores, and crossed the inlets, till they came to a projecting promontory, covered with wood. This spot charmed Thorwald; he exclaimed, "This is a beautiful spot, and here I should like to fix my dwelling." As they were preparing to go on board, they noticed three canoes on the beach, and under each canoe three *Skrællings* or dwarfs, which is the name given by the Northmen to the Esquimaux. A contest ensued, and eight of the nine Skrællings were killed. The ninth fled into the interior of the bay, from which he soon returned with a vast number of his countrymen. The party of Thorwald retreated to their vessel, and sheltered themselves behind its bulwarks; but Thorwald himself was mortally wounded by an arrow under his arm. Perceiving his wound to be fatal, he said to his companions, "I now advise you to prepare for your departure as soon as possible, but me ye shall bring to the promontory, where I thought it good to dwell. It may be that it was a prophetic word that fell from my mouth, about abiding there for a season. There shall ye bury me and plant a cross at my head, and also at my feet, and call the place KROSSANESS, in all coming time." They obeyed this command. Returning to Leif's booths, they passed the winter there, and the following spring went back to Greenland. The Keel Cape is supposed to be Cape Cod; and the promontory called Krossaness, from the fate of Thorwald, to be either the Gurnet opposite Plymouth, or Point Alderton in Boston harbour.

In the season following these events, Thornstein, the third son of Eric, embarked, with his wife Gudrida, in search of the body of Thorwald, which they wished to bring back to Greenland. The voyage was unsuccessful. They were tossed about all summer, and knew not whither they were driven. It was winter before they made the western coast of Greenland, where Thornstein died. In the spring Gudrida his wife returned to the family seat, at Ericsfiord.

The following year, 1006, is of importance in the history of these expeditions. In the summer of this year, there arrived in Greenland two ships from Iceland. The one was commanded by Thorfinn, surnamed *Karlsefne*, that is, the Hopeful, a wealthy and powerful personage of illustrious lineage, descended from Danish, Norwegian, Swedish, Irish, and Scottish ancestors, some of whom were of royal rank. The other ship was commanded by Biarne Grimolfson and Thorhall Gamlason. They kept the festival of Yule (Christmas) at Ericsfiord. Here Thorfinn became enamoured of Gudrida and espoused her in the course of the winter. The discoveries in Vinland were the great subject of interest in the family of Eric. Thorfinn was urged by his wife and the other members of the family to undertake a voyage to the newly discovered country. Accordingly, in the spring of 1007, he and his associates embarked in their two vessels; and a third ship, commanded by Thorward (who had married Freydisa, a natural daughter of Eric), was joined to the expedition. The party consisted in the whole of 140 men. They took with them all kinds of live stock, intending if possible to colonize the country. They touched at Halluland on their way southward, and found many foxes there. Markland also they found stocked with wild animals. Proceeding southward they made Kiarlaness (Cape Cod), and passed trackless deserts, and long tracts of sandy beach, which they called Furdustrandir. They continued their course, until they came to a place, where a frith penetrated far into the country. Off the mouth of it was an island, past which there ran strong currents, which was also the case farther up the frith. On the island there were an immense number of eyder-ducks, so that it was scarcely possible to walk, without treading on their eggs. They called the island Straumey (stream-isle), and the frith, Straumfiords (stream-frith); and on its shores they landed and made preparations for a winter's residence. They found the country extremely beautiful, and set themselves to explore it in all directions.

Thorhall, with a party of eight men, took a course northward in search of the settlements of Leif at Vinland, but they were driven by westerly gales to the coast of Ireland and there made slaves. Thorfinn, with the rest of the company, in all 131 men, sailed southward, and arrived at a place where a river falls into the sea from a lake. Opposite to the mouth of the river were large islands. They steered into the lake and called the place *Hop*. On the low grounds they found fields covered with wheat growing wild, and on the rising grounds vines. Here they were visited by great numbers of the natives in canoes. These people are described as sallow-coloured, ill-looking, with unsightly heads of hair, large eyes, and broad cheeks. Thorfinn and his company erected their houses a little above the bay and passed the winter there. No snow fell, and the cattle found their food in the open field. In the following spring, 1008, the natives began to assemble in numbers, and opened a trade with the strangers. The articles exchanged were furs on the one side, and strips of cloth on the other. In the course of the season, Gudrida, the wife of Thorfinn, gave birth to a son, who was called Snorre, and who was the first child, of European descent, born in America, and the ancestor of many distinguished personages at the present day, whose descent, according to the genealogical tables appended to the volume referred to, is lineally traced to Thorfinn and Gudrida. Among these we may mention professor Finn Magnussen, a native Icelander, now established at Copenhagen, one of the most distinguished Icelandic *savans* of the day, and Thorwaldsen, the great sculptor. After other adventures and contests with the natives, which are related with great particularity, Thorfinn returned with his party to Greenland. After a few years spent there, he purchased an estate in Iceland, in 1015, where he passed the rest of his life, as did Snorre, his American born son. After the death of Thorfinn, and the marriage of her son, Gudrida made a pilgrimage to Rome. The family remained distinguished for wealth, influence, and intelligence. Thorlak, the grandson of Snorre, was raised to the episcopal rank, and was of great repute for his learning. He compiled a code of the ecclesiastical law of Iceland, which is still extant; and is very likely to have been the person who committed to writing the *Sagas*, or traditions of the voyages and adventures, of which we have given a brief abstract.

In the year 1011, another voyage was made to Vinland by Helge and Finnboge, two brothers from Iceland, who were joined by Thorward and his wife Freydisa; but our limits oblige us to omit the tragical incidents of the expedition. It may be observed here, that the *Straumey* of the preceding voyages is supposed by the editor of the *Antiquitates* to be Martha's vineyard; *Straumfirth* to be Buzzard's Bay; and *Hop* to correspond with mount Hope Bay, the seat of king Philip.

For the residue of the eleventh century there are no accounts of voyages from Greenland to the newly discovered region. It is matter of conjecture only, that a continuous communication was kept up. In the year 1121, bishop Eric of Greenland embarked on a missionary voyage to Vinland, of which the result is not known. In 1285, a new land west of Iceland is said to have been discovered by two missionaries from that island. This new land is supposed to have been Newfoundland; and mention is made of a voyage from Greenland to Markland as late as 1347.

Such is the purport of the historical evidence contained in the volume referred to of the early discovery of America by the Northmen. We have retained many particularities of detail of little intrinsic importance, as they form a striking characteristic of the narrative, and contribute essentially to the means of judging of its authenticity. About one half of the volume consists of two narratives, which constitute the two most important chapters of the work. The first may be called the history of Eric, the first settler of Greenland, and the second, which is a longer performance, is the history of Thorfinn the Hopeful, who conducted the most important expedition to Vinland.

We have already observed, that the great fact asserted in these Icelandic accounts, is in itself in no degree improbable. That the greatest navigating people, who, before the invention of the mariner's compass, traversed the ocean, and who are known to have visited every part of the North sea, should, in their voyages to Iceland, Greenland, and Ireland, have been carried by northeastern winds to the coast of North America, is so far from being unlikely, that it is almost impossible it should not have taken place. With the settlement of Greenland the first step, of course, was taken toward the discovery of the American continent. If not a part of that continent, it is separated from it only by a narrow arm of the sea. Ten degrees of latitude, on the coast of Labrador, lie within a radius of 650 miles from Cape Farewell. The distance from the same cape to Newfoundland is not greater than that from Iceland to Greenland; from Norway to Iceland; or from Norway to the northwestern coasts of England. To pilots, accustomed to make the last-named voyages, and in strong and substantial vessels, such as we know were built by the Scandinavian shipwrights, (whose mythic prototype, Volundr, was deemed, by the enthusiasm of a simple age, to be endowed with more than mortal skill,) there is, certainly, nothing extraordinary or formidable, in running down from Cape Farewell in Greenland to Newfoundland.

The ancient accounts of these voyages contain nothing which, when rightly considered, ought to impair their substantial credibility on the score of extravagance. They present many of the characteristics of the legendary tales of rude ages; of the narratives of credulous mariners, relating their exploits in distant and newly-discovered countries. The German, Tyrker, whose discovery of the grape gave the name of Winland to the region, is represented as having lost his way from the exhilarating effect of the fruit which he had eaten, and recovering himself but slowly on his return. In the image of a German sea-rover intoxicated with eating fox grapes, there is indeed a ludicrous extravagance. So, too, the savage who shot Thorwald, is described as a one-legged animal, a phenomenon which awakens a burst of poetical admiration on the part of one of the company. On the death of Thornstein, in Greenland, while his wife, Gudrida, is holding the lyke-wake, the dead body enters into a conversation with her, and relates her future fortunes in the style of the epic visions of Greece and Rome. These are the ornaments, with which a traditionary tale is clothed by minstrels and rhapsodists; they are the superstitions of a credulous age; they are the romantic creations of weather-beaten mariners, sitting with their skinny-handed cronies, around a drift-wood fire, for the live-long Arctic night, and rehearsing the wonders of the sea. Rude but vigorous fancy redeems the frozen and homely poverty of real life. The poor seaman's cabin, excavated under the comfortable lee of a glacier, one half sunk into a frozen soil, the other covered with eternal snow, warms and flashes up with a strange pageantry. Its inmates have seen spirits dancing on the northern lights; they have beheld wild eyes glaring out of the ice-blink; have looked, with amazement, at the sea serpent, as he curls up and overtops the mainmast; have cast their anchor into the small ribs of the kraken; and, losing their way, have wandered into that dreadful Hafgerding, or place in mid ocean, where the waters rise up like mountains, on the three sides of a dreary plain, from which there is no escape to the astonished mariner. Regarding the age and the region, in which these Icelandic traditions must have circulated for two or three generations, we think they have suffered less than could have been expected from the credulity and extravagance, the superstition and the ignorance, of their narrators.

With regard to matters of a different kind, it must be admitted that there are some points, in which the traditions are inexact. The descriptions of the winters of Vinland certainly do not apply to the winters experienced in modern days in that portion of North America. "Such is the goodness of the land, (says Leif, the son of Eric,) as to show that the flocks had no need of pasture; for there were no wintry frosts, and the grass scarce withered." It may, however, be deemed a sufficient explanation of this difficulty, that to persons used to the climate of Iceland and Greenland, the ordinary winter of Massachusetts and Rhode Island would seem mild; and the cattle of the former region, when brought to the latter, might be capable, even before the introduction of artificial pasturage by agriculture, of subsisting themselves by browsing, like the moose and the deer at the present day.

The manner in which these accounts have been transmitted to us, though not *omni exceptione major*, is, upon the whole, satisfactory. Of the authenticity of the manuscripts there is not a shadow of doubt; of the age of some of them there is no question. These manuscripts carry back the record to the fourteenth, and even the thirteenth century. The substantial agreement of the accounts in one main tradition, and their difference in circumstantial details, are a sufficient warrant, that they were not, when produced, a wholesale fabrication. We have every reason to believe, from internal evidence, that the accounts contained in the existing manuscripts were faithfully compiled from older documents; from the metrical *Sagas;* and from traditions orally handed down in the families of the discoverers.

That such a discovery should have been made; so vast, so interesting; that expeditions to explore, to settle, and to evangelize the country should have been undertaken; and that a communication between America on the one hand, and Greenland and Iceland on the other, should have been kept up for three centuries and a half; that written accounts of these very important events should be in existence; and that the discovery should have been pushed to no greater consequences; nay, that all effective knowledge of it, after a time, should have perished; are, it must be admitted, circumstances somewhat difficult to explain. If it be hard to find a continent, one would think it must be much harder to lose one. When America was discovered by Columbus, the intelligence rung round Europe. The old world seemed to pour itself out upon the new. The discovery by the Northmen, to use a modern phrase, seemed, as far as we can judge, to produce no sensation in the world. It had no effect upon the mind of Europe at large. It led to no vigorous efforts at colonization; awoke no spirit of adventure; occasioned none of those mighty revolutions, which were caused by the discovery of Columbus; and was before long forgotten. These are difficulties which must be looked in the face.

Are they sufficiently accounted for by the want of the art of printing; by the less extensive prevalence of knowledge; and by the comparative barbarism of the eleventh and twelfth centuries, as contrasted with the kindling intelligence of the beginning of the sixteenth? Was the attention of the ardent spirits called forth in other quarters; to the revolutions that were advancing under Norman banners in Apulia and in Sicily; to the magnificent conquest of England by a Norman prince; and, above all, to the great movement of the crusades, which shook Europe to its centre? Again, the Spanish discoverers, on the first islands, and first portions of the continent which they visited, found the precious metals in abundance. This discovery urged the passion for adventure to madness. Gold and silver were found in heaps. The tale went home of rivers, that flowed over beds of golden sands; of temples, whose walls blazed with the precious mischief; of captive princes, purchasing their ransom by halls full of piled ingots. This turned the heads of men in the old country. They grew frantic to get at this gold; and it soon became necessary, in order to avoid the depopulation of Spain, that severe restrictions should be laid on emigration. But avarice was not the only master-passion, which was enkindled. The Spanish adventurers encountered at the outset a delicious tropical climate, a region inhabited by races which, compared with themselves, were unwarlike and timid,—whose civilization had furnished many of the arts of luxury and gaudy display, few of those of defence, at least against a mounted, iron-clad enemy, who fought with thunderbolts. Ambition was fired at the thought of achieving the conquest of vast realms, by a trifling expense of the resources of European warfare. The career of the Cortez and Pizarro was enough to ruin a generation of young men,—to corrupt the imaginations, and unsettle the judgments of men for a century. Far otherwise the case with the Northmen. They landed, at best, on an inhospitable coast; inhabited by a warlike race of savages; they themselves had no fire-arms; and the country, and those who occupied it, offered little to awaken either ambition or avarice. At a much later period, we witness the effect of this diversity in the character of the two portions of the continent, upon the conduct both of governments and individuals. Newfoundland, we know certainly, was discovered by Cabot, for England, a few years after the West Indies were discovered by Columbus for Spain. And yet, though the example of Spain, in turning her almost undivided attention to her new American acquisitions, was before the eyes of England, she neglected hers for three quarters of a century; and, at last, did little more than extend a parsimonious countenance to the feeble attempts of private companies to colonize the continent.

NORWAY, (*a*.) By the last census of Norway, taken in 1835, the total number of inhabitants was 1,194,827. In 1825 it was 1,051,318, or, according to other statements, 1,050,132; the increase, therefore, during 10 years was 13·6 per cent., or about 1½ per cent. annually. The total population in 1835 consisted of 585,381 males, and 609,446 females; the ratio of the two sexes being as 100 to 104. The rural population in the same year amounted to 1,065,825, of whom 523,922 were males, and 541,903 females, being in the proportion of 100 to 103. The population of the towns was 129,002, of whom 61,459 were males, and 67,543 were females, their relative proportion being 100 to 109. In 1825 the rural population was 935,855, and the population of the towns 115,463; consequently, the increase of the former during the 10 years was 14 per cent., and of the latter only 11 per cent.

The number of considerable towns in Norway is small, regarding as such every town with more than 3000 inhabitants. There are not more than 11 towns in this class, the population of which will be seen in the following table:—

TOWNS	1825.	1835.			
	Total.	Males.	Females	Total.	Paupers.
Christiania,	19,061	11.625	11,496	23,121	673
Bergen, .	20,844	10,665	12,174	22,839	831
Drontheim,	11,639	5,693	6,665	12,358	568
Christiansand,	7,486	3,615	4,050	7,665	370
Drammen, .	6,933	3,470	3,780	7,250	317
Frederikshald,	4,612	2.476	2,445	4,921	160
Stavanger,	3 777	2,256	2,601	4,857	123
Konigsberg,	3,691	1,625	1,915	3,540	324
Laurvig, .	3,106	1,600	1.813	3.413	123
Moss, . .	2,863	1,589	1,688	3,277	166
Arendal, .	3,202	1,450	1,779	3,229	138

From this we see that Christiania, the new metropolis of Norway, which in 1825 contained nearly 1,800 inhabitants less than Bergen, now contains nearly 300 more than that old, and once so celebrated town, in which it will also be observed, the paupers are considerably more numerous than in Christiania. Stavanger appears to have increased in population more than any other of these towns. Konigsberg, notwithstanding the wonderful increase which has occurred in the produce of its silver mine during the last 10 years, is one of the very few towns in Norway the population of which has decreased during that period. Here, too, the number of paupers is very great, being as numerous as in Drammen, where the population is twice as great. These remarkable facts indicate a change of the ancient seats of welfare in Norway.

In towns the proportion of females to males is as 109 to 100. In two or three of the towns this proportion is much smaller; and in Christiania and Frederikshald, the males exceed the females; but this must be owing to the military quartered in those places; for while in all the towns the number of married persons of both sexes is nearly equal, and in Bergen and most of the towns there is an excess of females among unmarried persons: in Christiania and Frederikshald, on the other hand, there is a large excess of unmarried males.

That the number of unmarried people of each sex should be in proportion to the total number of males and females respectively, would appear a very natural conclusion; but it appears that in Norway the number of unmarried males was 375,771, whilst that of females was only 373,728. But, on the other hand, the number of widows, 42,660, greatly exceed that of widowers, 16,625. If even a small portion of the excess consist of widows of a marriageable age, the natural proportion of the two sexes is restored. The fact itself admits of an easy explanation. The greatest number of unmarried persons are necessarily under 20 years of age, especially in a northern climate, where marriage seldom occurs under that age; and in this period of life the males predominate considerably. During the next 10 years, from 20 to 30, the females are slightly in excess, during which time more females will be married than males, who usually marry somewhat later in life. In the 20 years following the numbers are nearly equal. After 50, when the greater part of those of both sexes who are able to marry are already married, the proportion of females exceeds considerably that of males; but a great portion of this excess must consist of widows, not unmarried women; so that the sum of unmarried males, at all ages, would necessarily be somewhat greater than that of unmarried females. The excess of widows, as compared with widowers, is obviously caused chiefly by the greater mortality among men, which the tables attest, there being 116 women to 100 men alive beyond the age of 50, and the proportion increasing with each decennary period, viz., 123 to 100, beyond 60; 132 to 100, beyond 70; and 139 to 100, beyond 80 years of age.

With regard to the occupations of the population, Norway is essentially an agricultural country. Hence, among the total male population of 585,381 persons, of whom 434,267 are above 10 years of age, 158,405 are cultivators of the land, to which, as connected with agriculture, must be added a large portion of the journeymen and servants; 28,903 are engaged in navigation and the fisheries; 23,145 in commerce and manufactures; which number, however, may exceed that of seamen by the addition of a portion of the journeymen; 139,954 are classed as servants, of whom 124,627 belong to the country, and consequently especially to agriculture, and 15,327 to towns; 1,992 are officers, 2,104 are pensioners, and 30,697, or more than 5 per cent. of the male population, are paupers—4,720 being inhabitants of towns, and 25,977 belonging to the country.

In order to encourage cultivation in a country where the products of the soil are gathered only by a difficult and toilsome labour, the government of Norway has judged fit to free newly-cultivated land from taxes for a considerable space of time. Therefore, the cultivators of land are divided into two classes, taxed and not taxed. Of the former, there are 103,192; and of the latter, 55,213. The former are again subdivided into proprietors or freeholders, possessing what is called the *odels-ret*, of whom there are 72,624; and those with a limited possession, a right of use, or farm, of which class there are 30,568.

O

OCEANIA, (*a.* to *Oceanica.*) The name *Oceania* has been bestowed by modern geographers on that large region of the globe, which comprises all the islands in the Pacific ocean to the south and south-east of Asia, including the Asiatic archipelago, Australia, and Polynesia. This region extends from about the ninety-fifth degree of east to the 110th degree of west longitude, and from the twenty-fifth of north to the fiftieth of south latitude. Within these limits, stretching 10,000 miles in every direction, we have a vast ocean, with a profusion of islands scattered over it, one of them rather a continent than an island; five or six more, each equal in magnitude to almost any in the world; and one peninsula of great size. The great mass of the land lies between the 95th and the 106th degree of east longitude. Beyond the tropics, we have about two-thirds of Australia and the whole of New Zealand. All the rest of this region is strictly tropical, and by far the larger portion of it lies within ten degrees of each side of the equator. The total superficies of the land has been estimated at 3,100,000 geographical square miles, making this division of the globe therefore larger than Europe, although greatly smaller than Asia, Africa or America. A more distinct notion, however, will be conveyed to the reader by giving the superficies of a few of the principal countries composing it, as follow:—

Australia	1,496,000 square miles
Malayan Peninsula	48,000
Sumatra	130,000
Borneo	212,500
Java	50,000
Celebes	55,000
New Guinea	213,300
Mindanao	25,000
Luconia	30,600
New Zealand	150,000
	2,410,400

Besides these, nearly 100,000 square miles may be added for many considerable islands, varying in size from 1000 to 9000 square miles; so that the total area, exclusive of a vast multitude of isles and islets, which not only cannot be measured, but cannot even be counted, will be upwards of two millions and a half of square miles. Here are countries, then, greater in extent than China and Hindostan put together. Australia itself is more extensive than the Chinese empire; Borneo three times the size of Great Britain; Sumatra larger than Great Britain and Ireland put together; while Luconia, the principal of the Philippines, is equal in size to the last named island.

M. Balbi, in his geographical description of Oceania, has, with considerable success, classed it into three great divisions, viz. Malaisia, Australia, and Polynesia; and each of these he has described by groups and archipelagoes, selecting generally a principal island to distinguish the name of each, as the Group of Sumatra, the Group of Celebes, &c. Of these there are no less than forty-five, necessarily of very unequal magnitude and importance.

The geological formation of lands so extensive, so scattered, and so widely spread, is, of course, exceedingly various; but the primitive, and trap or volcanic formations prevail. To the first belong the Malayan peninsula, Borneo and Celebes. In those where granite is the principal rock, gold abounds; while the Malayan peninsula, with some islands adjacent to it, contains, besides that metal, the richest and most extensive tin formation in the world. The basaltic, or volcanic formation embraces the whole chain of islands from Java to Sumbawa inclusive, and comprehends most of the islands lying between Celebes and Papua, famous for the production of the clove and nutmeg. The basaltic islands are remarkably deficient in metals, but are more than compensated for it, in the majority of cases, by an incomparable fertility of soil. Of the mixed primitive and volcanic formations are composed the island of Sumatra, and the principal islands of the Philippine group. In these, gold is found, but less abundantly than in the countries of purely primitive formation; but they are at the same time of a soil more fertile. Australia, as might be expected from so extensive a country, comprises almost every variety of geological formation, primitive, secondary and volcanic. It abounds in mineral coal, which is also to be found in Sumatra, Java, and some of the smaller islands. The diamond is found in Borneo only. Copper is found, but not wrought, in Sumatra, Luconia and Timor. Lead is found in Luconia; and perhaps the most abundant ore of antimony in the world, and which now supplies the European market, is found in Borneo. Compared with other countries, iron may be considered as scantily produced every where, but particularly in the volcanic islands. Enough has never been produced for the consumption of the inhabitants, and this metal is, therefore, largely imported.

Even in Australia, contrary to what might be expected, there are no rivers of long course, or of great magnitude; and the smaller islands are of course deficient in them. Number, however, in some degree, makes up for the want of size. The high mountains of those within the torrid zone pour down a perennial and abundant supply of water, and there are no countries in the world consequently less subject to drought than these.

No region more abounds in mountains. The highest are found on Sumatra, Java, and some of the islands immediately to the eastward of the latter. These are of an elevation varying from ten to fifteen thousand feet. A great many of them are volcanoes, of which Java is thought to count not less than fifteen, Luconia four, and Sumatra, five. The eruptions of some of these, even in our times, have altered the very face of the lands in which they exist, and been accompanied by a vast destruction of life and property.

With the exception of New Zealand and the larger portion of Australia, which enjoys a temperate climate, the rest of Oceania is in the torrid zone; but the climate is tempered by a rich covering of vegetation, frequent and abundant rain, and the insular character of the whole region. A portion of Australia alone is within the region of variable winds; the rest within the influence of the trade-winds, or monsoons. From Sumatra to New Guinea, and even thirty degrees further east, although more uncertain, the latter extend. To the north of the equator, the wind blows half the year from the south-west, and half the year from the north-east, uninterruptedly; and to the south of the equator, half of the year from the north-west, and the remainder of the year from the south-east. In these tropical regions the season of continual rain generally does not exceed three months. Here the distinctions of summer and winter, of spring and autumn, and the changes in the vegetable creation, by no means however very distinct, alone proclaim a change of season.

Of the varied vegetable productions of these countries it would be in vain to attempt even the barest outline. The greater portion of the country is, down to the present day, unaltered by the industry of man, and as it came from the hand of nature, covered with primeval forests of rich foliage, with very trifling exceptions, in one uniform and perpetual verdure. The useful vegetable products of these islands, indigenous or exotic, are numerous and various. Some of the chief indigenous plants of the greatest utility, are rice, a variety of palms, but chiefly the cocoa-nut, the sugar-cane, the clove, the nutmeg; and among fruits, several cucurbitaceous plants, the shaddock, the banana, the delicate mangosteen, perhaps the most exquisite of known fruits, and the durian, unquestionably the most rich and luscious. Among exotics, but long and thoroughly naturalized, may be named many pulses, maize, cotton, pepper, coffee, tobacco, the mango, and the pine-apple.

Animal life is nearly as vigorous and varied as even the vegetable. In the tropical portion of Oceania the greater animals are confined to the greater islands. The elephant, of the same species as the common Asiatic, is known only on the Peninsula, Sumatra, and a small portion of the north-east part of Borneo. Two species of rhinoceros, distinct from those of Africa and Asia, are confined to the Malayan peninsula, Sumatra, Borneo and Java; and the two first named afford the tapir, an animal of the same family, and long supposed to be peculiar to the American continent. The tiger is never found in these countries in any small island, even when that island is in the immediate vicinity of a large one abounding with it. This animal, and many others of the feline tribe, abound in all the large islands to the westward, but seem to disappear as we advance to the eastward. In the forests of the great islands also are to be found the wild ox and buffalo, the originals of those that have been domesticated. Deer are found chiefly in the great islands, and these of many varieties, differing in size from considerably smaller than an ordinary rabbit, up to that of the elk. The hog is nearly universal, and as abundant as it is widely spread. When we get into the Moluccas and approach the shores of New Guinea, we find a remarkable species of this animal, to all appearance equally partaking of the hog and the deer, and justly called by the natives the Babirusa, or hog-deer, of which this is the literal interpretation. The number and variety of the monkey tribe, all, or almost all, differing in species from the same family in Europe, Asia, Africa and America, is prodigious; and they are almost as widely disseminated as they are various and numerous. The Ourang-outang, or man of the forest, so called by the natives themselves, seems confined to Borneo and Sumatra. Notwithstanding a certain resemblance to the human form, this is one of the dullest and least intelligent of the race. The feathered tribe becomes the more remarkable as we proceed eastward. Here they are of singular forms, and their plumage is of resplendent beauty. It is here we find the most remarkable of the parrot family, the louris, and the cockatoos, names that are slight corruptions of native terms. Here are to be found the whole family of the birds of paradise, and the magnificent crown-pigeon, nearly equal in size to the American turkey. Here also the kangaroo begins first to present itself. In the narrow and temperate seas of this region it may be expected that fish should abound, and this is found to be the case, particularly where extensive banks exist, as the Straits of Malacca, a kind of Mediterranean sea; the northern coast of Java; the shallow bays which indent the Celebes, and the group of the Philippines. A few of these fish are not inferior in flavour to the best of the northern seas. Seals do not present themselves till we get beyond the tropics; and whales are comparatively rare within the equatorial region. The cod, the herring, and the salmon, so familiar to Europeans, are unknown. The abundance of fish, and the facility of taking them, has rendered the fisher, instead of the hunter state, the prevailing condition of most of the rude tribes.

To the sketch now drawn, the zoology of the South Sea Islands, and especially of Australia, offers well known exceptions. Animal life is there comparatively scanty in amount, and the few which exist, although singular for their forms, are for the most part mean and low in the scale of beings, as compared to the lower animals of the longer known portions of the globe.

M. Balbi, who has furnished a table of the population of Oceania, makes it amount to 20,300,000, being at the rate of 6½ to the square mile; this, he observes, makes it twice as populous as America, and nearly as much so as Africa, but only one-fourth part as populous as Asia, and one-tenth part as Europe. We are disposed, however, to consider this estimate as greatly beyond the mark. The English population of Australia, and of our settlements in the straits of Malacca, together with that of Java, and of the Spanish portion of the Philippines, are all that have been ascertained by actual enumeration. The population of the British possessions is above 150,000; that of Java six millions; and that of the Spanish possessions nearly as M. Balbi has given it, or 2,640,000. This makes in all 8,790,000, or under nine millions. The countries thus stated are by far the most populous; Java gives a ratio of 120 to the square mile; and Luconia, which has a million and a half of inhabitants, gives near 50. These are the only countries that in reality have a considerable population,—from whence then are to come the eleven millions and a half, wanting to complete M. Balbi's number? The only other countries of considerable extent which are tolerably populous are Sumatra and Celebes; as the greater part of these are still covered with forests, if we reckon them as being equal in ratio to one half of that of Luconia, they will give us an addition of 4,625,000, which will raise the whole to 13,415,000. Borneo is, with the exception of a patch here and there at the mouth of a navigable river, either in a state of nature, or sprinkled with a population of savages, less numerous than the apes in their own forests. The Malayan Peninsula, and the great island of Mindanao, are pretty nearly in the same predicament. A few of the smaller islands, as those of the Lubeck group, Amboyna, and Ternate, are tolerably well peopled. If we give, in short, a million and a half to the whole of which we have not attempted a separate estimate, we shall make the total population of this region amount to fifteen millions, which is unquestionably its utmost extent, and there will be a necessity for curtailing M. Balbi's estimate by at least five millions.

The native inhabitants of Oceania consist of two, indeed most probably of three, distinct races of men. The first and most important of these, both in numbers and civilization, is a yellow or brown complexioned race, with long lank hair, scanty beards, high cheek bones, large mouths, and short noses, with wide nostrils. In their persons they are squat, somewhat robust, and deficient in agility. Their general stature is greatly less than that of Europeans, and also much below that of the Chinese, of most of the Hindoo nations, the Turks of Asia, and the Persians. They are even shorter than the Birmans and Siamese, whom they most resemble. This race constitutes the entire native population of Sumatra, Java, Borneo, Celebes, and the greater number of the South Sea Islands, and forms the great mass of the population of the Malayan peninsula, the Philippine islands, the Moluccas, &c.

The second race are negroes, and Mr Marsden very properly adopts for them the name of *Negritos*, or little negroes. Although negroes, however, they are a totally different race from any of the negroes of Africa. They have thick lips, flat noses, a sooty complexion, and wool-like hair. In their persons they are smaller and slenderer than the yellow race, and upon the whole are among the most diminutive, puny, and ill-favoured of the human species. They present themselves for the first time, (unless we except the inhabitants of the Andaman islands, in the Gulf of Bengal, which seem to be precisely the same people,) in a few scattered families or tribes in the mountains of the Malay peninsula. In Sumatra, Java, Borneo, and Celebes, they are not ascertained to exist, although this has been sometimes vaguely asserted to be the case. They appear for the first time, in considerable numbers, in the Philippine group, as wandering savages in the mountains of the principal islands, and constituting the entire population of some of the smaller. In the great island of New Guinea, they appear to constitute the mass of the population, such as it is, and here for the first time they are seen with some approach to civilization. The same race constitutes the population of almost all the islands from New Guinea to the Feejees inclusive, extending over fifty degrees of longitude. The yellow complexioned race, then, once more appears, and occupies all the islands to the east, north, and south, except New Holland and Van Dieman's Land, which are peopled by the Negritos.

The third race has been considered as the result of the admixture of the yellow and negrito races. But for making this assumption, there appears no justifiable ground. In this race, the lips are thick, the hair not woolly or lank, but crisp and curled, and the complexion darker than that of the first, but less intense than in the second race. In strength and stature they seem equal to the first. These present themselves, for the first time, as we proceed eastward, in the island of Ende; we have them again in Timor and the neighbouring islands, and they constitute the entire inhabitants of Tanna, New Caledonia, and the Feejee group.

The existence of these three distinct races of men, inhabiting one and the same country, is a strange and singular phenomenon. It is as if the European, the African, and the Hindoo races were huddled together, and inhabiting the same countries of Europe, the strongest driving the weakest into the mountains, or into remote and inaccessible quarters.

There is a wide difference in the degrees of civilization attained by the different tribes and nations of the vast region which we are describing. Some of them cannot count above four, and others have made a respectable progress in all the useful arts of life. Those who have attained the highest degree of civilization may, not unfavourably, be compared to the continental nations of Asia of the second rank, such as the Birmans and the people of Siam, Lao, and Camboja, whom indeed they greatly resemble in person, manners, and acquirements. They have made advances far beyond what had been attained by the most polished nations of America before the Spanish discovery. The nations which have acquired this extent of civilization are the Malays, Rejangs, Achinese, Lampongs, and (although occasionally acting the cannibal,) the Battas of Sumatra, the Javanese and Sundas of Java, the Bugis and Macasars of Celebes, and the four principal nations of the Philippine islands. Some minor tribes may indeed with safety be added, as the people of Bally, Lombock, Suluk, Ternate, and Mindanao. Among these nations there are four that stand pre-eminent, viz. the Malays, the Javanese, the Bugis, and the inhabitants of Luconia in the Philippines. The agriculture of these is equal to that of any people of continental Asia, the Chinese alone excepted; but for some share of this they are perhaps considerably indebted to a favourable soil and climate. From time immemorial they have tamed and used most of the animals which are used by the nations of Asia and Europe, and are fitted for the peculiarity of their climate, such as the horse, the ox, the buffalo, the dog, the hog, the cat, and the ordinary descriptions of domestic poultry. They have long cultivated the cotton plant, and weave and dye cotton fabrics with considerable skill. They have for ages been in possession of the useful and precious metals, and used money in their commerce. They have possessed the art of writing for a great many ages, and this art apparently sprang up among themselves, for there arose among them, as will afterwards be shown, no less than seven distinct alphabets, all of which, to appearance, are original and unborrowed. They possess a calendar, or divide time systematically, so as to regulate with considerable accuracy the common transactions of life. Their political institutions go a great way towards preserving order, and securing life and property, and their religion, for the most part, does not appear to have been accompanied by any bloody or cruel rites. Wherever the culture of grain is understood, and it is so among all the principal nations, civilization has most advanced. Where the people live on the produce of the sago-palm, and bread fruit, they have made less progress, and are found universally ignorant of the use of letters. Where fish is the chief subsistence, they are in a still lower state; and they are always savage when they live upon the casual produce of the forests, honey, wild-roots, and game.

The minor nations are in a very different state of society. A few of the yellow coloured race apply to some extent to agricultural pursuits; but the greater number lead a wandering life, living on the casual produce of the forests, rivers, or seacoasts. Some are cannibals, and most of the tribes live in a state of perpetual warfare with each other; one of their strongest passions being that of hunting for the skulls of their enemies, which they pile up in their dwellings from generation to generation, as honourable trophies and heir-looms. With the exception of a few of the Negritos of New Guinea, who appear to have made some small progress in the arts, this race will be found more abject, miserable, and mischievous, than the lowest of the yellow race.

What is the origin of these different races? From whence did they migrate, if they migrated at all, or are they indigenous? Is the language spoken by these different races one and the same primitive tongue, originally spoken by one nation, and split into many dialects by the dispersion of its members? or, is each of the multitude of tongues now spoken, itself the distinct language of an original tribe? These are questions as curious as they are difficult of solution, and in the usual absence of historical records on such subjects, can only be answered, if, indeed, answered at all, by a critical examination of language. This has been attempted by the late Dr Leyden, by Mr Crawfurd in his History of the Indian Archipelago, and more fully and carefully by Mr Marsden, in his work on the Polynesian or East Insular languages.

There is not to be found throughout the whole of the Oceanic languages, one of complex structure, like the Sanscrit, the Greek, the Latin, and the German, in which the genders, numbers and relations of names, and the tenses and modes of verbs are formed by inflexions or varying the terminations of words; and, most probably, there never existed such a language. Still, preserving a close affinity, however, there are some of which the grammatical structure is a good deal more complex than that of others. In the language of the Philippine islands there is a dual number, and the verb is of considerable complexity in its form. The same observation applies in both respects to the languages of the rudest people of all, those of the continent of Australia. The construction and the rules of syntax of the languages of the South Sea Islands also differ very materially from those of the great tribes of the eastern islands.

In the languages of the Malayan or yellow complexioned race, there exist a great many words, which, in a greater or lesser degree, are common to almost all, and considering the state of society which belongs to even the most civilized of these nations, it is truly remarkable to what an extent this identity of particular words and terms pervades. It has been discovered to exist, in a manner which leaves it quite unequivocal, in the language of the people of Madagascar, not above two hundred and fifty miles from the coast of Africa, and in that of the people of Easter Island, not above fifteen hundred miles from the coast of South America. The distance of these two points cannot be less in any way than ten thousand miles. The degree in which identity of words can be traced is greatest among the more civilized nations, and, excluding Madagascar, which will be afterwards considered, decreases as we proceed eastward from Sumatra and Java. It wholly excludes many of the Negrito tribes, but not all, as will afterwards be shown. To account for this striking and interesting fact in the history of man and language, it has been argued that all the languages from Madagascar to Easter Island inclusive, the Negrito dialects excepted, were originally one language, and that the difference in them now discovered is simply the result of the dispersion of those who spoke it. But we are disposed to consider this theory as untenable. It appears to us to be contrary to all our knowledge and experience of the history of languages. Languages are many when people are savage and rude, or semibarbarous: in proportion as men become civilized, and communities become extensive, they become few in number, the smaller and ruder dialects being gradually absorbed or violently exterminated by the prevalence of the more polite, improved, and consequently more useful. We are unaware of the existence, in ancient or modern times, of any one language widely disseminated and extensively spoken by many rude tribes, disconnected by locality and without the knowledge of letters.* The whole world seems to us to abound with illustrations of the opposite truth. In China, as Du Halde observes, "every province, every great city, nay, every town, and for that matter, every large village, has its peculiar dialect, which is the reigning language, for every body speaks it, the learned as well as the common people and women. But then the women and the common people can talk no other." This arises from the obstacle already alluded to. Notwithstanding this, the Mandarin or common language is the general vernacular language of the inhabitants of the province of Kyang-nan, a population amounting to no less than 72,000,000 of people, a greater amount than that of the United Kingdom, France, Belgium, Holland, and the Peninsula put together.* In the Hindoo-Chinese countries, there exist at least twenty different languages, yet the great bulk of the people speak but six only. In Hindostan there are probably not less than forty distinct languages, yet the great mass of 120,000,000 of people use but eight, the remaining inhabitants, (a mere fraction, and consisting of the rudest of the whole,) having more than thirty languages amongst them. In Europe we see the most civilized and numerous communities speaking one language, as the German, the Italian, the French, the English, and the Spanish, while many tongues become numerous as we enter the barbarous parts of it, Russia and Turkey. In France, and in the British islands, the rude Celtic, to the great benefit of society, is in gradual progress of extinction, and even the Anglo-Saxon dialect of the Scotch is rapidly giving way to the English. In America, before the Spanish conquest, there existed but two or three tolerably polished languages, each of them spoken by a pretty numerous population. In that continent, although several have disappeared, it is known that there are still spoken upwards of 400 distinct languages, with not less than 2,000 dialects, by the indigenous population, who, at the utmost are not reckoned above 10,000,000 in number, whilst the Anglo-Americans, who speak but one language, are themselves alone more numerous.

On the principle that each Oceanic language is of separate and distinct origin, and that the people by whom they were spoken communicated words to each other exactly in proportion to the closeness of neighbourhood, or extent of intercourse between them, the ruder and weaker tribes commonly borrowing from the most improved and powerful, the different languages may be divided into several classes or groups, and named after the nation which seems to have exercised the greatest influence in its propagation. The first or Malayan group, includes Sumatra, the peninsula of Malacca, and the east and west coasts of Borneo, over which the Malayan language exercised such influence. The second or Javenese group, includes the island of Java and the neighbouring islands of Madura, Bali, and Lombox; in these the Javanese, a language bearing considerable resemblance to the Malayan, prevailed. The third or Bugis group, from the name of the principal nation and language of Celebes, extended itself over the islands of Bouton, Salayer, and Sumbawa, and part of the south coast of Borneo, where the Bugis settled and founded states. The Bugis language differs very materially from the two preceding. The fourth or Philippine group, in which the Tagala language has probably the greatest influence, takes in the great archipelago of the Philippines, including Mindanao, the cluster of the Sooloo islands, with Palawan, and a small portion of the southern promontory of Borneo. In the fifth or Molucca group, the leading influence was probably exercised by the language of the most civilized nation, the people of Ternate. A sixth group will embrace the South Sea Islands, inhabited by the yellow-complexioned race, whose languages, as we are informed by Mr Ellis in his Polynesian Researches, possess a great number of words that are common to all the dialects of the south sea, but which differ entirely from those of the northern or western Oceanic nations. A separate group, smaller than any of the preceding, might be formed of the languages spoken from Flores to Timor inclusive, by that race which is neither yellow-complexioned nor Negrito, but partakes of both, and which we have conjectured to be a third and distinct Oceanic race.

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* The Celtic language is said to have been universally spoken in Spain, Gaul, and the British islands, and the German language equally so from the Rhine to the Baltic; but of this there is no proof, and we are disposed to dispute a fact which is contrary to all authentic analogy in other parts of the world.

* Companion to the Chinese Kalendar. Canton, 1832.

To attempt any classification of the languages of the Negrito tribes would, from our ignorance, be a hopeless undertaking. From the little that we do know of them, they would seem, as we might very well expect, to differ even more from each other than they do from the languages of the yellow complexioned race, or as much as the most dissimilar of these differ from each other. In truth they will probably be found not to admit of any such classification. The language of each tribe among this race will in all likelihood be found distinct and original, and, wherever there are words in common, it will be only where an immediate neighbourhood has made the communication easy and readily available, to a people so exceedingly rude, weak, and ignorant. Specimens have been obtained of the dialects of the Negritos of the Andaman islands, of the Malayan peninsula, of New Guinea, and of those of several tribes of Australia; but, except in a few instances in the Australian languages, easily accounted for by the vicinity of the tribes, there is no semblance of affinity between any of them; an analogy which tends materially to discredit the hypothesis which would attribute a common origin to the languages of the yellow complexioned race.

It should be here observed, that what are called, in Europe, dialects, or the subdivisions of one language, under different names, much modified by time and circumstances, as in the case of the Spanish and Portuguese, of the Scotch and English, or the Erse and Irish, have no existence among the Oceanic nations. Languages here which have different names are never dialects of each other. A Malay is utterly unintelligible to a Lampong or a Batta, although his neighbours. A Sunda is unintelligible to a Javanese or to a native of Bali, although the three languages are written in the same character, and the nations speaking them contiguous to each other. In the same manner, a Bugis is unintelligible to a Macasar, although their languages are written in the same character, and although they have repeatedly conquered, and been conquered, by each other. If we are to credit some voyagers, this is not the case in many of the South Sea Islands. A native of the Society islands is, for example, described in Cooke's Voyages as being perfectly well understood by the natives of the Marquesas, distant at least 800 miles. We are inclined to question the accuracy of this statement, and rather to believe that Tupia, the friend of captain Cook, had imposed on the illustrious navigator and his companions, than to credit a story alike inconsistent with experience and analogy. The dialects of the same language which exist, however distinct the people speaking them, are but trifling modifications of what may be considered the parent language; and this is probably in a great measure owing to the very remarkable simplicity which is characteristic of the structure of all the languages of the Oceanic region. A Malay of Champa, Johore, and Borneo, have not the least difficulty in understanding each other, and the same is the case with the Bugis of Boni, Tuwaju, and of the Bornean colony of Cooti. They, in fact, amount to little more than provincial variations.

The question still remains to be considered, how any portion of an Oceanic language, to whatever country that language belonged, should have reached points so exceedingly remote as Easter Island and the Sandwich group on one side, New Zealand on another, and Madagascar on a third. There can be no question, we think, but that the language must have been communicated from the populous and civilized quarter to the less populous and civilized, that is, except in the instance of Madagascar, from west to east. Any other theory would suppose a case which has never happened in any other part of the world, of weak and barbarous tribes imposing a portion of their language upon more powerful and civilized ones. It is perfectly easy to understand how such a language should have spread from one tribe to another within the tranquil and narrow seas, and with the assistance of the steady monsoons, between Sumatra and New Guinea. Considering the many islands, not very remote from each other, which run from New Guinea to the Friendly Islands, it is perhaps not very difficult to conceive how words of a western language should be communicated to the inhabitants even of these distant islands. Monsoons, or winds blowing one half of the year from east, and the other half from west, are now ascertained to prevail as far as the island of Rotuna, between the 170th and 180th degrees of east longitude, which in the course of ages would carry even frail native praos from one island to another, and thus propagate the common language. With respect to the more distant countries, considering the ignorance, unskilfulness, and want of enterprise, which characterise the state of society, even among the most improved of the insular races—races which have never gone, but by accident, beyond the precincts of their own peculiar region—the difficulty of rationally accounting for it is great. The matter must not, however, be left in the condition of a miracle or wonder: we must therefore make the attempt.

Beginning our examination to the north of what may be strictly called the Oceanic region, the first and nearest countries which occur, although not strictly within that region, are the Nicobar and Andaman islands in the gulph of Bengal—the first inhabited by the yellow complexioned race, with lank hair, and in a very tolerably civilized state; and the last by a Negrito race, in the very lowest scale of human existence. The nations inhabiting these two groups have every appearance of being, physically, the same, respectively, as the yellow and negro races of the Oceanic region, and yet their languages not only differ entirely from each other, but neither of them contains one word of the Oceanic languages. The languages of the Nicobar group, although agreeing in many words, appear radically to differ among themselves. It is certainly a most remarkable circumstance that these islands, the largest of which is not above a hundred miles distant from the north-west extremity of Sumatra, and between which the illustrious navigator Dampier sailed in an open boat, should not contain a word of the Oceanic dialects, so widely spread in other quarters; neither do they seem to have adopted the language or religion of the Hindoos or Mohammedans. The natives of the Nicobars, however, have their own peculiar numerals, and in other respects exhibit considerable evidence of an indigenous civilization; they did not therefore stand in need of foreign aid, and the distance, although short, is in a stormy sea, with neither monsoon favourable. It may be added that the languages of these islands are polysyllabic, and partake in no respect of the monosyllabic languages of the adjacent continent. The existence of a yellow complexioned race in this quarter, and so near, yet with wholly distinct languages, ought, one might suppose, to be of itself quite sufficient to destroy the theory of one great Oceanic language.

The first point where we discover evidence of an Oceanic language is among the people of Champa, both on the shores of the China sea, and on the gulph of Siam. This is, however, an affair of comparatively modern times, and the result of the settlement of a Malay colony about 400 years ago. The people are of a different race from the inhabitants of the country, and, speaking a polysyllabic language among monosyllabic ones, are distinct to the present day; and their speech, of which we possess a tolerably copious vocabulary, is nothing more than a slightly modified dialect of the Malay.* We find the next traces in the island of Formosa, not above fifty miles from the coast of China. The west coast and plains of this island are peopled by a comparatively recent Chinese colony, but the mountainous eastern side by an aboriginal race. It is, of course, in the dialect of these last only that traces of an Oceanic language are to be discovered. From vicinity and similarity of words, we judge that these people received the Oceanic dialect through the medium of the Philippines. The distance from the northern part of Luconia does not exceed 300 miles, and with the westerly monsoon, which is the mild one in the China seas, there would be no difficulty, even in a very rude state of navigation, in passing from the last to the first. From the same Philippines, in all probability, the Oceanic dialects were communicated to the Marianne, the Pelew, and the Caroline islands, for here also the monsoons are propitious.

Turning now to the south-east, we are disposed to consider that the centre from which the Oceanic language was communicated in this quarter, was the language of the Bugis of Celebes. These, to the present day, hold a commercial intercourse with the Aru islands and the Negritos of New Guinea, and proceed yearly to the gulf of Carpentaria, in Australia, to fish the Holothurion or Sea-Slug, for the market of China. To the natives of New Holland, who cannot count beyond four, and who are too brutal to receive any useful information, they have communicated nothing. If in the course of this voyage, their praos should be drifted by the prevailing easterly wind to the westward, they would naturally keep hold of the coast of Australia, and fortune and accident might conduct them to the latitude of westerly winds, which, in due course would bring them down upon the land of New Zealand, where they would first discover men of the same race with themselves, and, notwithstanding the barbarism of their manners, men bold, adventurous, and not inaccessible to a rude instruction. The praos of New Zealand might be drifted down by westerly winds even as far as Easter Island, and from Easter Island the trade winds would drift them, or the inhabitants of the island, upon the Marquesas and the Society Islands, from whence again a voyage seems practicable, even with praos, and within the trade winds, to the Sandwich Islands. The great similarity which exists between the numerals of all these islands, makes this hypothesis not improbable; at all events, it wears a greater air of probability than the supposed existence of one original general language, of which the experience of the rest of the world affords no example.

We have only now to consider how the Oceanic language reached Madagascar, distant from the nearest point of the Oceanic region, Sumatra, more than 3000 miles, in a strait direction. This, although at first sight the most difficult circumstance to be accounted for, turns out, in reality, to be one of the easiest, while, at the same time, it tends to illustrate the manner in which migration and dissemination of language may have taken place within the Oceanic region itself. Since our own possession of the Mauritius and its dependencies in Madagascar, during the last twenty-four years, several praos, drifted from Sumatra by the strength of the north-east monsoon, and carried into the trade winds, have reached Madagascar, as the first land, with several of their crews, whose lives were preserved by the accidental presence in their boats of a few cocoa nuts, which served them both as food and drink. These strangers, arriving among a very rude people, such as the inhabitants of Madagascar still are, (and which they would be in a still greater degree, were we to deprive them of the ideas and objects which are expressed in their language by Oceanic terms,) may be easily conceived in a condition to communicate useful instruction to them; more particularly when such instruction was of so humble a character as not to be above the capacity of the latter, as the numerals, and the name of rice, an article now extensively cultivated in Madagascar, and the introduction of which was probably owing to a few accidental handfuls found in the drifted praos of the Oceanic tribes. That this was the original channel of communication we think we are warranted in assuming, not only from these being the nearest countries, but from the striking similarity of the words in the respective languages. The languages of Acheen and the Nias islands are probably those which furnished words to the dialects of Madagascar. But it is by no means necessary to refer to one or two languages only. Words might be adopted from several of the Malayan dialects, according to the tribe of strangers that reached the coast of Madagascar. That such was the case, is rendered the more probable, when it is found that the several dialects of Madagascar do not always employ the same Oceanic term for the same thing. We may, however, observe, that the real number of Oceanic words that exist in these dialects, is, after all, but inconsiderable. We suspect that they will not exceed 100 or 150; a small addition indeed to a language which, in common with others of the same class, we have no doubt, will be found to contain not less than from 5000 to 6000 words. Neither do the borrowed words seem to be radical, but, on the contrary, such as men would naturally adopt in the progress of improvement, or such as all languages are liable to receive through caprice or accident, a process of which we have already given sufficient examples. The people of Madagascar are, in reality, a Negrito, or at least a Negro race, and if the Oceanic words found in their language were really radical, this ought to prove them to be of the yellow complexioned race, and disprove that part of Mr Marsden's theory, which proceeds on the belief that the languages of the Negritos and yellow complexioned race are radically and essentially distinct.

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* Crawford's Journal of a Mission to Siam and Cochin-China, p. 467.

We have but very few words to say respecting the origin of the races that inhabit the Oceanic region. The yellow complexioned bears, as already noticed, the nearest resemblance, in form and complexion, to the Hindoo-Chinese race; but notwithstanding this, and their immediate neighbourhood, the evidence of language shows that there is not the slightest connection between them. The Malays and Siamese meet at the seventh degree of north latitude—their territories and their people are intermixed, and several of the Malay states have been for ages subject to the power of Siam; notwithstanding all this, their respective languages and manners are preserved perfectly distinct. Living among each other, they continue, to almost every intent and purpose, two distinct nations. The Oceanic tribes, therefore, did not emigrate from the Hindoo-Chinese countries; and the idea of a Chinese or Tartar origin is too ridiculous to deserve a moment's consideration. Neither did they emigrate from the continent of America. An examination of the nearest languages of that continent has detected no resemblance whatever in their genius, structure, or sound, to the Oceanic languages. It would be quite useless to attempt to trace their origin to the country of the Hindoos, of the Persians, or of the Arabs; for from all these people they are as distinct in physical form, and in all the essentials of language, as both are from the nations of Europe.

With respect to the Negrito races, the only people to whom they bear the least resemblance are the Negroes of the continent of Africa; but from them they are clearly a distinct race, being eminently wanting in the stature, figure, and general physical form of the Africans, while similarity of language has not been proved to exist in even a single instance. Besides this, there is the insuperable difficulty of reaching the Oceanic region from Africa, distant from 3000 to 4000 miles, in the very teeth of a vigorous trade wind. The fable of a Portuguese ship or ships being wrecked on the islands of the Oceanic region, with African slaves on board, is unworthy of all sober attention. With respect to the third race, if such it really be, intermediate between the yellow complexioned and the Negrito, nothing whatever exists to show its foreign origin. The three races then must be concluded to be aboriginal; and when we are reduced to adopt this position, we are certainly in no worse situation than when we attempt to trace the migrations of the old inhabitants of any other quarter of the globe. The races of the Oceanic islands are peculiar, like those inhabiting Europe, or Africa, or America. An indigenous and independent civilization has sprung up among them, and in the course of many ages this civilization has been gradually, widely, and silently spread, in the manner in which we have endeavoured to explain. History, of course, makes no mention of the changes which this civilization has effected, because a people so rude have no history. The utmost length to which we can carry back the annals of the more civilized nations of the Oceanic region does not exceed six centuries, and even to this length we can only proceed with the aid of medals and monuments. It is but a poor antiquity that can hardly carry us back within two centuries of the Norman conquest of England! It by no means follows, however, that the Oceanic nations, and even their civilization, are not of very considerable antiquity; and we shall, probably, not mislead ourselves if we ascribe a period of several thousand years as having elapsed between their emerging from the savage state, and the time in which they are first mentioned in history. To the civilized nations of the ancient world they were nearly as unknown as the inhabitants of America; and the first acquaintance with them made by the nations of modern Europe goes little further back than three centuries, when they were found very nearly in the same state of civilization as that in which they exist at the present day.

O'KEEFE, JOHN, a well-known dramatic writer, was born at Dublin; his father was a native of King's county, and his mother an O'Connor of the county of Wexford. He was educated by Father Austin, a learned Jesuit, and an able orator; and was pursuing the study of drawing with the view of following the profession of an artist, when he imbibed a passion for the stage. Having been introduced to Mr Mossop, he obtained an engagement for three years at the Royal Dublin Theatre; and he continued to perform in that city, and in the most respectable towns to which the company made summer excursions, for the space of twelve years. Though tragedy was his first choice, an accident soon discovered his forte to be comedy, to which he then turned his principal attention. His ambition to figure as an author was coeval with his theatrical taste; for, at the age of fifteen, he attempted a comedy of five acts, which, though wild and in parts puerile, he conducted to a dénouement with considerable ingenuity. When established as an actor, he every year produced some local trifle at his benefit. His first production, however, which attracted any important public attention, was his farce of "Tony Lumpkin;" which, after it had been acted successfully in Dublin, he sent to Mr Colman, and it was played with equal success at the Haymarket in 1778. This was succeeded in 1779 by "The Son-in-law," another farce, which was a great favourite at Dublin. Soon after this he left Ireland; and, on his arrival in London, applied for an engagement; but his services as an actor were declined. He then devoted himself entirely to dramatic composition, and produced in succession the following pieces:—The Dead Alive, a comic opera; the Agreeable Surprise, a farce; and the Banditti, a comic opera, all in 1781. Lord Mayor's Day, a pantomime, 1782. Maid the Mistress, a burletta; the Shamrock, a farce; the Young Quaker, a comedy; the Birthday, a dramatic poem; and Friar Bacon, a pantomime, all in 1783. Omai, a pantomime, 1785. Siege of Carzola, a comic opera, 1786. Prisoner at large, a comedy, 1788. The Toy, a comedy, 1789. The Fugitive, a musical entertainment, 1790. World in a Village, and London Hermit, comedies, 1793. Wild Oats, a comedy, 1794. Life's Vagaries, a comedy, and Irish Mimic, a musical entertainment, 1795. The Lie of the Day, a comedy, and The Lad of the Hills, a comic opera, 1796. Some of these were not printed; but in 1798 the following were collected and published in four volumes:—Alfred, a drama. The Basketmaker, a musical entertainment. The Beggar on Horseback. The Blacksmith of Antwerp. The Doldrum. The Eleventh of June. Little Hunchback. Modern Antiques. The Positive Man, and Tantararara Rogues All, farces. The Castle of Andalusia. The Czar Peter. The Farmer. Fontainbleau. The Highland Reel. Love in a Camp. The Man Milliner. The Poor Soldier, and Sprigs of Laurel, all denominated comic operas, or musical farces. Le Grenadier, a pantomime; and The Wicklow Mountains, an opera. In the same year he produced The Nosegay of Weeds, a farce, and She's Eloped, a comedy, which were not printed. The dramatic works of O'Keefe exceed the number of fifty, if to the foregoing be added some manuscript plays. In the year 1800, being reduced by blindness and other misfortunes to a state of great embarrassment, O'Keefe obtained a benefit at Covent Garden theatre, when the first piece performed was his "Lie of the Day." At the end of the second act Mr Lewis led the author upon the stage, and he there delivered a poetical address, in which humour and pathos were very happily blended. At a subsequent period, it is stated that his circumstances were so far improved, that he was enabled to return a donation sent to him by the literary fund society,—an action which reflects the highest credit upon his honourable feelings. In 1828, his health declining, and ever having had a strong predilection for Devonshire, he removed westward, for the purpose of reaching, by easy stages, Sidmouth, or the neighbourhood of Exeter; but, on arriving at Southampton, it became apparent that a journey of eighty miles was a sufficient trial of his strength. Here he took up his abode, and remained until the day of his death. His in-door amusements consisted of hearing the newspapers, magazines, and other publications, particularly Sir Walter Scott's novels, read to him by his daughter. On the mention of his own Cowslip, a character in the "Agreeable Surprise," which occurs twice in the "Tales of my Landlord," he smiled silently and was gratified; but when spoken of by name in "St Ronan's Well," he looked evidently black and displeased. The words are "from Shakspeare to O'Keefe." "Ha!" he said, "the top and the bottom of the ladder; he might have shoved me a few sticks higher." It may be observed here, however, that Scott, in the expression, refers to the interval of *time* between the two dramatists, and not to their relative merits. O'Keefe died on the 4th Feb. 1833, aged eighty-six.

OLDHAM; a town in the hundred of Salford, and county of Lancaster, England, situated on the river Medlock, six miles direct distance north-east from Manchester. About the middle of the last century, it consisted only of a few scattered houses, but with the progress of our manufactures, it has risen rapidly into importance, owing to its being in the vicinity of extensive coal-mines. Cotton, fustians, woollen and silk goods are manufactured to a large extent, and the making of hats is also carried on here on a great scale. An extensive inland navigation powerfully promotes the trade of the neighbourhood, both in coal and the multifarious branches of manufacture: commencing at Hollinwood, the Oldham canal communicates with the manufacturing metropolis, Manchester, and the towns of Ashton-under-Lyne and Stockport; and the Rochdale canal, proceeding through Chadderton, connects a number of important places with this part of the county. Another advantage, of high consideration to this town, is its vicinity to Manchester, the paramount mart for cotton goods, and where so vast a demand for the mineral product of this neighbourhood always exists. The town possesses a good parish church, and a number of dissenting places of worship. It was first constituted a borough by the reform bill, and now returns two members to parliament. Mr Cobbett was one of its first representatives. The limits of the borough, as defined by the boundary Act, comprise the townships of Oldham, Chadderton, Crompton and Royton, containing collectively a population exceeding 60,000 residents. Population of the township in 1841, 42,595.

OLD RED SANDSTONE. In the geological series of formations, the position of the old red sandstone is between the grey wacke series and the mountain limestone of the carboniferous series. It is a reddish or grayish sandstone, sometimes close grained and compact, sometimes friable and marly, and frequently of a coarse conglomerated structure. Beds of shale are found alternating with the sandstone, and sometimes grayish flagstones or slates. In general there are few indications of organic remains, but occasionally beds are found full of the remains of fishes interspersed with vegetable impressions of fuci and reeds. Of the fishes, the most common genera are dipterous, acanthodes, osteolepis, gyrolepis, cephalaspis, a species of ray, and a nondescript animal called coccosteus. The old red sandstone is found succeeding the Silurian, or transition rocks of England; it is abundant in Scotland, cropping out along the south and north ridges of the great Grampian range of primary mountains which intersect the northern division of the country. The quarries of Clashbinnie in Perthshire, several localities in Forfarshire, Garrie in Banffshire, Scaalcraig, Dipple, and the Findhorn in Morayshire, and the Sutors of Cromarty, all afford specimens of the organic remains of this particular formation.

OLEAGINOUS PLANTS. Among the articles of vegetable food, the oils which are extracted from plants afford one of the most valuable; nor are they of less importance in affording us light by their combustion. They are employed also in a number of manufactures, such as soap, woollens, varnishes, and perfumery. There are two kinds of vegetable oil, distinguished by the name of fixed and volatile. The latter may be extracted from almost every plant; but it is used only as a perfume or to flavour liqueurs, such as the oil called Attar of Roses. These sweet-scented oils constitute the luxury of the sense of smelling, but are frequently prejudicial, from their effect on the nerves; and some few of them are employed medicinally. But the essential or volatile oils are not those most deserving our attention; the fixed oils are of much higher importance, and are extracted from a class of plants, hence called oleaginous. The oil is expressed from the seed of all these plants excepting the olive, in which it is obtained from the pericarp. The greater part of the seeds of oleaginous plants contain albumen, and it is from this that the oil is obtained; but when the seed has no albumen, as is the case with the poppy, it is the embryo which furnishes the oil. In the family of the *Euphorbaceæ*, all of which have oleaginous seeds, the embryo is of a venomous nature, and oil extracted from it would be poisonous; while that expressed from the albumen of the same plant, situated contiguous to the embryo, is perfectly innocent. Such is Bancul nut (*Aleurites Moluccanum*), which is remarkably mild, and is eaten by the inhabitants of the Molucca isles, as we eat hedge-nuts in Europe, while oil obtained from the embryo is an acrid poison. The fixed oils obtained by cultivation may be ranged under three heads: 1st, Olive-oil, the produce of warm climates; 2d, Nut-oil, that of temperate climates; and 3d, Oils obtained from the seeds of oleaginous herbs. The olive-tree originally came from Syria. That plant, as well as the vine, was brought to Marseilles by the Phocians; and, at the present day, it is cultivated on all the shores of the Mediterranean. It is a tree of very slow growth, but of long duration; it can support a temperature as low as eight or ten degrees of Fahrenheit, provided the air be dry; but, if accompanied with humidity, one or two degrees below the freezing point, proves fatal.

The cultivation of oleaginous herbs enters into the course of cropping; they exhaust the soil almost as much as grain, on account of the number of seeds to be ripened; they require, therefore, a considerable quantity of manure. These herbs are generally of the cruciform family, containing azote, an element of the animal kingdom which forms excellent manure; so that, after the soil is expressed, the cake which remains serves to restore the exhausted soil. Rape is a species of cabbage with thin roots, whose seeds yield excellent oil. The poppy is an oleaginous plant, with white, scarlet, and violet flowers, while the seeds are white or black. They yield oil, perfectly innoxious and wholesome, though drawn from the same plant which supplies us with opium. Flax also is an oleaginous herb. It is, however, chiefly cultivated for its stalks, from which linen thread is fabricated; but its seed also yields the oil we call linseed-oil. It is much used in the art of painting. Hemp is of the same description. There are some few oleaginous herbs of the leguminous family, such as the subterranean arachis (*Arachis hypogæa*), a plant we derive from America, which has the singular property of ripening its seeds under ground. This plant requires a loose sandy soil, in order that the lower branches may be enabled to bury themselves in the ground. In a state of cultivation, the earth should be heaped over them, as is done with potatoes. The upper branches, which blossom in the air, ripen no seed; while the lower lateral branches, which burrow in the earth, develope no regular blossom; that is to say, have no petals; but the stamens and pistils bring the seeds to perfection.

O'MEARA, Barry Edward, formerly surgeon to the ex-emperor Napoleon; was a native of Ireland, and the son of a military officer. He was educated at Trinity College and the royal college of surgeons, Dublin; and at an early age was appointed assistant surgeon in the sixty-second regiment, with which he served for some years in Sicily, Egypt, and Calabria, and was the senior medical officer to the troops which held the celebrated fortress of Scylla, the last stronghold by England on the continent of Europe during the resistless sway of Napoleon. Having sustained a siege for six weeks from a French corps of 6,000 men, under gen. Lamarque, the garrison was at length compelled to abandon the fort, then reduced to a heap of ruins, and to retreat in boats. Mr O'Meara was recommended for promotion; but, some months after, had the misfortune to incur the displeasure of lieut.-gen. Sir John Stuart, by having acted as second to an old schoolfellow in an affair of honour; and, though the issue of it was bloodless, Sir John thought fit to compel both the challenger and his second to quit the army, judging it necessary to adopt the most rigorous measures in order to put a stop to a practice then too prevalent in the British army in Sicily. However, by the recommendation of Mr Green, then the chief of the medical department in the Mediterranean, Mr O'Meara was immediately appointed assistant surgeon in the navy, and served as such on board the Victorious, commanded by admiral Sir John Talbot, and afterwards as surgeon of the Espiegle sloop and of the Goliah rasee. In the latter he served until the surrender of Bonaparte to the British government, when he was directed to accompany the emperor to St Helena in the capacity of medical attendant. In this difficult situation he acted to the entire satisfaction of Sir George Cockburn, who then had charge of Bonaparte, and of his successor Sir Pulteney Malcolm, and also received the thanks of lord Melville; but not harmonizing so well with the measures of Sir Hudson Lowe, which he deemed arbitrary and cruel, and "finding that more was required from him than he could reconcile with his feelings of honour," a rupture took place. Sir Hudson desired him to hold no further communication with the ex-emperor or any of his suite except on medical subjects; Mr O'Meara tendered his resignation, and after a long correspondence returned to England. On his arrival in London, he was well received by the lords of the admiralty, and it is said the valuable situation of surgeon to Greenwich hospital was offered to him; but, having preferred to the admiralty accusations against Sir Hudson Lowe for tyrannical and oppressive conduct towards his prisoner, and other serious charges, his name was, by order of their lordships, erased from the list of naval surgeons. He afterwards produced various publications relative to his late employment; the titles of which were:— "Manuscript de l'Ile d'Elbe. By Napoleon." "Letters from the Cape of Good Hope." "Letters from St Helena." "Letters from Count Las Casas, with a Preliminary Discourse." Exposition of the treatment of Napoleon Bonaparte." "A Translation of the Memoirs of Napoleon, by himself." "A Voice from St Helena; or Napoleon in Exile," 2 vols. 8vo.

Mr O'Meara's death took place at London, on the 3d June, 1836. Some time before his death, he had married a lady of considerable fortune, which made him very easy in his circumstances.

OOLITE; one of the series of geological formations, the *Lias*, (which see) forming the lowest division. It is called oolite, or roestone, from ωον, an egg, and λιθος, stone, being composed of innumerable small globules, like the roe of a fish, imbedded in a calcareous cement. Sometimes these globules are the size of a pea; hence the term pisiform. The formation consists of a series of beds of impure yellowish limestone, alternating with beds of clay sandstone and marl, the average depth of which may be about 1200 feet. The colour is usually yellowish, brown, or ochray; the stone is of a dull earthy nature, rather friable, and unsusceptible as a polish. The Bath and Portland oolites are used as building stones, but they are not very durable. The nature of the globules which give the character to this stone, is not distinctly ascertained, it being doubtful whether they are crystalline minerals, or of animal origin. The organic remains found in the oolite are very numerous, and differ somewhat from the lias below. The different beds of the same series also vary, and have been divided into lower, middle, and upper. The lower beds contain numerous species of the ammonile, the namblus, belumnite, and other chambered univalve shells, while the unchambered univalves are rare. Numerous bivalve shells, whose inhabitants appear to have existed in shallow seas, are also found in the oolite. Madripores, multipores, sponges, and other zoophytes, compose those beds denominated *coral rag*. The remains of fishes and reptiles, similar to those of the lias, together with several species of the pterodactyle, or flying lizard, and animals of the crocodile genus, all indicating the proximity of dry land, are abundantly common. The subordinate beds of this series are,

Bath oolite, containing minute globules, and broken shells cemented by calcareous matter, forming a compact building stone, for which purpose it is extensively used.

Cornbrash, abounding in fossils, and overlying coal beds in Yorkshire and Savoy.

Oxford clay. Between the lower and middle oolites occurs a stratum of bituminous clay, 200 feet thick, containing septariai, and skeletons of the icathyosaurus, specifically different from those of the lias.

Middle oolite consists of beds of silicious and calcareous sandstone, with madripores.

Kimmeridge clay, lies between middle and upper oolite; it is bituminous, of a grayish colour, and containing bones of saurian reptiles.

Upper oolite is composed of a calcareous silicious freestone, with beds and nodules of flint. This is the Portland stone, of which Somerset House, and other public buildings in London, are constructed.

Stonesfield slate is found in the oolite of Oxfordshire. Its organic remains consist of the horny covering of insects, bones of the opossum, the migalosaurus, a gigantic lizard, forty feet in length.

OPIUM, (*a.* to article *China* in *Supplement*.) The chief places where the poppy is cultivated in India for the manufacture of opium are at Malwa, Benares, and Behar. One half of the Indian drug is grown at Malwa, and there the cultivation of the plant and the trade in opium are free, as the management of the soil is beyond the authority of the company, although the chiefs are under British protection. Nearly the whole of this portion goes to Bombay, where it is shipped for China. At Behar and Benares, on the contrary, and indeed throughout the territories under the jurisdiction of the East India Company, the cultivation of the poppy, the preparation of the drug, and the traffic in it until it is brought to Calcutta, are under a strict monopoly. In these districts the ryot or farmer is frequently compelled to cultivate the poppy at a fixed rate, and should it be discovered that he does this clandestinely, without having entered into such an engagement with the government, his property would be immediately attached, or he would be obliged to give securities for the faithful delivery of the product. A system of most oppressive espionage is at the same time established for the purpose of preventing the traffic in the slightest portion of this valuable drug. At certain seasons the Company's godowns are opened at Calcutta, and the sales of opium effected. Great numbers of the residents purchase for the sake of speculation, as the price continually varies in China. Such a wakeful eye is kept over the drug that it is scarcely possible to purchase a single pound at Calcutta from any other than the agents of the government.

From Mr Montgomery Martin's "Statistics of the Colonies of the British Empire," a notion can be obtained of the revenue derived by the Indian government from the monopoly in opium. From this it appears that in the season

	Chests.		Sicca Rupees.
ending 1800, they sold	4,054	for	3,142,591
1810 . .	4,561		8,070,955
1820 . .	4,006		8,255,603
1830 . .	8,778		11,255,767
1835 . .	12,977		13,215,464
1837 . .	16,916		25,395,300

Estimating the value of the sicca rupee at 2s. sterling, the opium sold in the season of 1837 would amount to £2,539,530.

Up to the late rupture with China, the trade in opium was conducted as follows. When the sales were effected at Bombay and Calcutta, the opium was shipped on board vessels expressly fitted for the trade, which proceeded immediately to China. They were called *clippers*, were remarkably handsome, well-built ships, and possessed superior sailing qualities. Arrived on the coast, they delivered their cargo into a class of vessels called *receiving ships*, anchored at the station of Lintin, or the adjacent anchorages of Capsingmoon or Cumsingmoon, situated without the Bocca Tigris, at the mouth of the Canton river.

As the importation was expressly forbidden by the Chinese government, it had now to be smuggled clandestinely into the country. For this purpose native smuggling boats were employed, which were well manned and armed. Orders from Canton were given to them, with which they proceeded to the receiving ships, and the opium was delivered to their charge. It was taken out of the chests, examined, and removed after being packed in convenient parcels, ready to be easily carried off in case of pursuit. Collision with the authorities rarely took place, as fees were regularly paid for connivance to the officers of the imperial preventive squadron. Indeed, it was not unfrequent for the custom-house officers themselves to be engaged in the smuggling trade, and government boats have been observed taking in a cargo of opium in the open face of day. This was the usual way in which the importation was effected, but some portion was also taken up to Whanpan occasionally, and a certain number of chests was disposed of along the coast to the northward.

When arrived at the provincial city, the opium passed into the hands of native brokers or *melters*, who subjected it to a process by which the crude article was reduced to a watery extract. The Chinese designate the varieties of Indian opium by the names of *black earth*, *white skin*, and *red skin*, which severally fetch about 800, 600, and 400 dollars a chest. The quality which they prize in these samples may be gathered from a paper by Dr Butler, "On the Preparation of Opium for the Chinese Market," published in the Journal of the Asiatic Society of Bengal, in March, 1836. "The great object of the Bengal opium agencies is to furnish an article suitable to the peculiar tastes of the population of China, who value any sample of opium in direct proportion to the quantity of hot-drawn watery extract obtainable from it, and to the purity and strength of the flavour of that extract when dried and smoked through a pipe. The aim, therefore, of the agencies should be to prepare their opium so that it may retain as much as possible its native sensible qualities, and its solubility in hot water. Upon these points depends the virtually higher price that Benares opium brings in the China market, and the lower prices of Behar, Malwa, and Turkey opium. Of the last of these, equal (Chinese) values contain larger quantities of the narcotic principles of opium, but are from their greater spissitude, and the less careful preparation of the Behar and Malwa, incapable of yielding extracts in equal quantity and perfection of flavour with the Benares."

From calculations made by foreign residents in China, and published in the Chinese Repository in the year 1836, it appears that if 34,000 chests of opium are imported, they would yield 33,320,000 taëls, nearly equivalent to an ounce weight of smokeable extract. By allowing one taël to each person for daily consumption, the number of smokers supplied by this quantity of the drug would be 912,000. But it is evident from statements which subsequently appeared from other parties, that a mace, nearly equal to a drachm weight of the extract, would be an ample allowance for daily consumption. When we consider also that the same portion is two or three times ignited, that the extract which in its fresh state served the luxurious mandarin one day, supplies the pipe of an inferior the next, and that even the dregs and dirt of the pipe are greedily devoured by the menial, the number of consumers is greatly increased, and may be fairly estimated at more than two millions. But even this number, large in itself, looks small before the Chinese population of 300,000,000, or, as some will have it, 350,000,000; and if the above calculations be correct, we must believe, that the use of opium is not yet widely spread throughout the empire, but is confined to certain districts.

It is allowed that the effects of opium are the same whether swallowed in a solid or liquid state, or smoked through a pipe. The latter plan is usually practised by the Chinese, and no doubt would be pernicious even if used with moderation. But we will venture to say that this scarcely ever occurs. The pleasure is so great or the infatuation so strong that it cannot be resisted, and the drunkard is the victim of his folly. The words of a great poet, now no more, (Coleridge) on this subject will be recollected. They occur in a letter written to an intimate friend, while he was still a slave to the "accursed habit" into which "he was seduced ignorantly." "For ten years," he says, "the anguish of my spirit has been indescribable. Conceive a poor miserable wretch, who for many years has been attempting to beat off pain by a constant recurrence to the vice that reproduces it. Conceive a spirit in hell employed in tracing out for others the road to that heaven from which his crimes exclude him. In short, conceive whatever is most wretched, helpless, hopeless, and you will form as tolerable a notion of my state as it is possible for a good man to have. In the one crime of opium, what crime have I not made myself guilty of? After my death, I earnestly entreat that a full and unqualified narrative of my wretchedness and its guilty cause, may be made public, that at least some good may be effected by the direful example."

The following extract from a pamphlet published at Calcutta under the title of "Remarks on the Opium Trade with China," expresses the more injurious effects of opium over ardent spirits:—

"The intoxicating property, or rather properties, of opium, differ in their nature from the intoxicating property of alcohol. In some respects the effects of the intoxication are also different. They both agree, however, in this, that they both stimulate the nervous system to an unnatural degree, and are only fit for use when such a state of bodily illness already exists as to make a stimulus of this nature subservient to the restoration of other vital functions disordered. They both agree in this, that the pleasurable sense of excitement attending their indulgence is followed by a relaxation of the system, and an undue depression of both the bodily and mental powers when the excitement is over. They both agree in this, as a consequence, that the oftener they are indulged in for the sake of this pleasurable sense of excitement, the greater must be the quantity used, in order to keep up that same degree of excitement; so that, if once the appetite is formed, constantly increasing indulgence is necessary and almost inevitable, and not only so, but is yielded to unconsciously of this increase. The craving of the appetite is insensibly the man's standard for estimating what he can (as he supposes safely) indulge in. They both agree in this, that they disorder the digestive organs, predispose to most other diseases, and materially shorten the term of life. They both agree in this, that they stupify and derange the intellectual powers, and that habitually; for the seasons of depression are quite as far below healthy mental vigour, as those of alternate excitement are beyond. And over the final stages of mental suffering to which they both lead, one is fain to draw the veil; fiction can paint nothing of horror half so horrible. They both agree in this, that they utterly corrupt the moral sense: give to gross appetite the reins of reason; deprave and brutalize the heart: shut up all the avenues to conscience: and make their victim the easy prey to every temptation that presents itself. There is but one point of difference between the intoxication of ardent spirits and that of opium deserving of particular attention here; and that is, the ten-fold force with which every argument against the former applies to the latter. There is no slavery on earth to name with the bondage into which opium casts its victim. There is scarcely one known instance of escape from its toils, when once they have fairly enveloped a man. We need not appeal to the highly-wrought narrations of personal experience on this subject, which have of late years come before the public; they rather invite distrust than otherwise, by the exaggeration of their poetical style. But the fact is far too notorious to be questioned for one moment, that there is in opium, when once indulged in, a fatal fascination, which needs almost superhuman powers of self-denial and also capacity for the endurance of pain, to overcome. The operation of opium is, on this account, more deadly by many degrees than its less tyrannous rival. In other respects above-mentioned there is generally a more rapid and more permanent influence exerted by opium than by ardent spirits: an influence so directly inimical to all human happiness whatever, that if the facts were not before our eyes, we might well doubt the cunning of the arch fiend himself to recommend to one son of Adam the use of such an instrument of self-destruction."

In March, 1839, the Chinese government appear to have taken more decided steps than any which had yet been adopted to prevent the introduction of opium, and under the direction of the imperial commissioner from Pekin, the British residents were shut up in their factory, and only obtained their release on condition of giving up the stock of opium on board the ships, amounting to 20,283 chests, worth nearly £3,000,000 sterling, the superintendent of British trade giving the owners indemnity scrips. The contents of every chest were subsequently emptied into sluices communicating with the river, in the presence of the Chinese authorities, and many of the residents of the British and other factories who were invited to attend. Men were employed from day to day in hastening the process of maceration until the opium had become muddy and fetid, when the whole of it was washed into the river. After this the merchants withdrew to Macao, whence they were expelled by the Chinese on the 27th of August, in consequence of refusing to give up a seaman who had killed a Chinese in a brawl. They then retired to their ships at Hong-Kong; but the fleet being in want of provisions, the superintendent of British trade, on the 4th of September, endeavoured to obtain a supply from the natives, but was opposed by the Chinese war-junks; and in the conflict which ensued, several Chinese were killed, and some Europeans wounded. A fresh attack upon the Chinese, which was to have been made the following day, was countermanded. On the 11th of September the superintendent notified a blockade of Canton river and port; but on the 16th the blockade was abandoned, in consequence, it is said, of negociations having been commenced with the Chinese. Proceedings of a still more serious nature have taken place subsequently; and these events have greatly complicated the state of our relations with China. In the speech from the throne, on the opening of parliament, on the 16th of January, 1840, the interruption of our commercial intercourse with that country was formally announced; and a naval force has been despatched for the purpose of aiding, by a warlike demonstration, the negotiations which may be required to settle these serious difficulties. In the meantime the sales of opium are advertised at Calcutta as usual; and the general opinion is that it will be found impossible to prevent the introduction of the article into China by any plan however rigorous; for the individuals, who should put the prohibitory law in executions conspire to evade it; and generally speaking, are so low in moral character, as to prefer their interest to their duty.

The people of Java are addicted in a very remarkable degree to excess in the use of opium. Such of the natives or slaves as have been rendered desperate by the pressure of disappointment or misfortune, give themselves up entirely to the baneful indulgence, until their minds are raised to a state of frightful excitement, or rather frenzy. In this state they rush forth with dreadful purposes against all by whom they think they have been wronged or offended. They run along shouting "Amok! amok!" or "Kill! kill!" and in their blind fury stab at every person they meet, until self-preservation obliges the people to kill them as we kill a mad dog. This is what is termed "running amuck." This is most commonly the result of the strong propensity of the people to gambling, by which they are often deprived of all they possess in the world, and, "worst loss of all!" even lose their own self-respect. The immediate destruction of the muck-runners is authorised by the law in Java.

In some parts of India, opium is presented at visits and entertainments in the same familiar manner as the snuff-box in Europe. There is in that country a class of persons who carry letters and run with messages through the provinces. With no other provision than a piece of opium, a bag of rice, and a pot to draw water from the wells, these men perform journeys that would scarcely be credited in this country. In the same manner the trackless deserts of the different countries between the Indus and the Mediterranean are traversed by foot messengers by the aid of this drug, with a few dates perhaps, and a piece of coarse bread. The old traveller, Sir Thomas Herbert, very well describes this use of opium. "Opium (the juice of poppie) is of great use there also (in Persia:) good, if taken moderately; bad, nay mortal, if beyond measure: but by practice they make that familiar which would kill us; so that their medicine is our poison. They chaw it much,—for it helps catarrhs, cowardize, and the epilepsie; and, which is admirable, some extraordinary foot-posts they have who, by continual chawing this, with some other confection, are enabled to run day and night without intermission, seeming to be in a constant dream or giddiness, seeing but not knowing whom they meet, though well acquainted, and miss not their intended places, by a strange efficacy expulsing the tedious thoughts of travel, and rarely (wonderfully) for some days deceiving the body of its reasonable rest and lodging."

The very extensive use of this drug in Turkey and Persia is no doubt in a great degree owing to the prohibition of intoxicating liquors by the Mohammedan law. It was a substitute for them. Accordingly the use of the drug has much declined in Turkey of late years, since those who would otherwise have been opium-eaters have learned to indulge in wine and arrack. Nevertheless, the occasional use of opium is far from having ceased, nor has the race of *Theriakis*, or habitual opium-eaters, become extinct.

In England opium is almost entirely employed as a medicine. In Lincolnshire, it is said to be taken for its intoxicating properties, the practice having originated in its use as a remedy for the ague. The assertion that opium is taken with the same object in the manufacturing districts of Lancashire cannot be traced to any authentic source, and we do not believe that the abuse of the drug is prevalent in those parts. Neither opium nor any of the preparations in which it is a chief ingredient ought to be used except under the direction of medical men. It appears from a return made to the house of commons in 1839, that out of 543 persons in England and Wales who died from the effects of poison in 1837 and 1838, and on whom inquests were held, the fatality was occasioned in 186 cases by opium or its preparations; and nearly one-seventh of the whole number of cases (seventy-two) were young children, most of them under one year, to fifty-two of whom an overdose of opium, or laudanum, or some cordial in which opium is used, had been given; and in twenty other cases the children had been poisoned by taking such medicines in mistake.

ORMSKIRK; a town in the hundred of west Derby, county of Lancaster, situated on the road from Liverpool to Preston, 209 miles from London, and thirteen N. from Liverpool. The trade and manufactures of Ormskirk are on a limited scale, the principal establishments being hat manufactories and roperies. Ormskirk is a station for taking votes at the election of members for south Lancashire. The gingerbread made in this town is held in great estimation, and finds a ready sale in the surrounding towns. The church, dedicated to St Peter and St Paul, is very ancient. Population in 1841, 4891.

ORNITHYCHNOLOGY, (ὀρνις, ἰχνος and λογος,) signifying *stony bird-tracts;* a new and distinct branch of Oryctology, hitherto unnoticed and unexplored. In our article *Organic Remains*, we were very brief on Fossil Birds, owing to the paucity of materials. Indeed, the almost entire absence of birds from the organic remains found in rocks, has been a matter of considerable surprise to geologists. Up to the present time, there have only been nine or ten species mentioned by Cuvier, which he discovered in the tertiary gypsum beds near Paris. He regards all the cases reported by previous writers, as deserving little credit.

Geologists have assigned probable reasons, founded upon their structure, for these not being met with in a fossil condition. They are less liable than quadrupeds to be submerged beneath the waters, so as to be fossilized in aqueous deposits, and even when they happen to die in the water, they will float on the surface, and may therefore be discovered and devoured by rapacious animals.

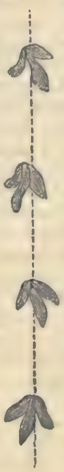
Some unexpected disclosures of the foot-prints of birds in fossiliferous rocks of the new red sandstone formation, on the banks of the river Connecticut, in Massachusetts, United States of America, have thrown some light upon this curious subject. These have been described by professor Hitchcock of Amherst college. His attention was first directed to this subject, by two slabs about forty inches square, which were originally united face to face; and on separation, presenting four most distinct depressions on one of them, with four correspondent projections on the other; precisely resembling the impressions of the feet of a large bird in mud. So perfect are these impressions, that among hundreds who have examined the specimens, none have the least doubt of their origin. These slabs were dug out of a quarry, in the south-west part of Montague, not half a mile from Connecticut river, and elevated about one hundred feet above that stream. The strata dip in an easterly direction, in an angle of only five degrees; and the layer containing the impressions was several feet below the surface. Only one kind of foot-print has been found there.

At Deerfield, Horse Race, Mount Tom, and many other places, these foot prints are found in the sandstone, some of them being small, and others incredibly large. At the last locality mentioned, there are three varieties of the rock in which these impressions occur: 1. A reddish fine micaceous sandstone passing into shale; 2. A gray micaceous sandstone; 3. A very hard sandstone, not being fissile and quite brittle, composed of clay and sand. This spot is more than thirty miles from Horse Race.

At the five quarries, these impressions are exhibited on the rock in its place, as depressions more or less perfect and deep, made by an animal with two feet, and usually three toes. In some few instances, a fourth hind toe, or hallux, has made an impression, not directly in rear, but inclining somewhat inward, and in one instance all the four toes point forward. Sometimes these ternate depressions run into one another, as the toes approach the point of convergence, but they also sometimes stop short at that point, as if the animal had not sunk deep enough to allow the heel to make an impression. At that point the stone is in some cases irregularly raised, as if the weight of the animal had caused the sand or mud to crowd upwards in rear of the step, and in a few cases, also, behind this slight elevation, there is a depression as if a knobbed heel had sunk slightly into the yielding mass.

In many instances, also, there is a remarkable appendage to the hind part of the impression; radiating from it in rear, in the larger tracts, to the distance of several inches, which has all the appearance of the impression of stiff hair or bristles.

In all cases where there are three toes pointing forward, the middle one is the longest; sometimes to a very considerable extent. In a majority of cases, the toes gradually taper more or less to a point; but in some most remarkable varieties, they are thick and somewhat knobbed, and terminate abruptly in most instances with claws. In the narrow bed impressions, distinct impressions of claws are not often seen, although they are sometimes discoverable. But this depends much upon the quality of the rock. If it be composed of fine clay, the claws are usually well marked. If the rock is cleaved a little above, or a little below the layer, on which the animal originally made the impression, the claws will, in all probability, not be visible. If a portion of the rock containing these impressions be carefully cloven, one face will present a ternary depression; and the other face will exhibit a corresponding figure, projecting more or less, sometimes in high relief. The specimens in *alto relievo*, often give a better idea of the structure of the foot that made the impressions, than those that are depressed. These tracks are in regular succession in innumerable instances, and have doubtless been made by an animal in the act of walking, as exhibited in the annexed figure of the *O. Minimus*.



Many of the rocks exhibit the footprints in an irregular mass, as if the bird had been walking to and fro. In the continuous tracts the impressions are not in a straight line, but the alternate impressions of the right and left feet pointing outwards, and deviating as much from the straight line as might be expected from a biped in progression forward. The interval, also, between the different steps varies; sometimes several inches in the smaller impressions, and even a foot or two in the larger; just as much, indeed, as we should expect in an animal moving at different paces: and where the impressions are distinct, it is easy to determine whether it were made by the right or left foot of the animal. This can be decided even in insulated foot-prints. Sometimes different species of animals, and different individuals, have crossed one another's tracks so often, that all is confusion; the whole surface being trodden over, as we often see to be the case where quadrupeds or ducks and geese resort, upon the muddy shores of a stream or pond. In short, there cannot remain a doubt but these impressions are the tracks of birds, made while the incipient sandstone and shale were in a plastic state. That they are the foot-prints of birds, the following arguments go to prove:

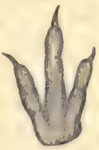
1. These impressions are evidently the tracks of a biped animal; for in no instance has there been discovered the existence of more than a single row of impressions. 2. They could not have been made by any other known biped, except birds. 3. They correspond well with the tracks of birds; having the same ternary division of their anterior part as the feet of birds. Frequently, and perhaps always, the toes, like those of birds, are terminated by claws. If the toes are sometimes slender, and sometimes thick and blunt, so are those of birds. If the hind toe or hollux is mostly wanting in these impressions, so are the feet of many genera of birds, especially the grallæ or waders.

The accompanying figure represents recent impressions in mud, of the Canada goose (Anas Canadensis). The length of the foot is four inches, and of the step seven inches. The space beneath the web connecting the toes, is quite obvious on the mud; it being sunk below the general level, but not so deep as the toes. The entire absence of any such appearance in the fossil tracks, makes it almost certain, that none of them were produced by web-footed birds.

All the varieties of tracts hitherto discovered, may be included under two divisions: 1. The *Pachydactyle*, or thick toed; 2. The *Septodactyli*, or slender toed.

Division I.—Pachydactyle. Hitchcock.

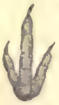
The toes of almost equal thickness through their whole extent, except that they are tuberous, and terminate rather abruptly; and usually with a pointed claw.



1. *Ornithicnites giganteus.* Toes, three, directed forward; length of the foot, fifteen inches, exclusive of the claws; claw about two inches in length; total length of the foot from sixteen to seventeen inches! Length of the successive steps, from four to six feet! Toes somewhat tuberculated; inner one, in some specimens, distinctly exhibiting two protuberances, and the middle one three, less distinct; average thickness of the toes, one inch and a fourth; breadth of ditto, two inches. Average step supposed to be four feet.

From the length of step, the bird must have been twice the size of an ostrich, and its head elevated twelve to fifteen feet above the ground. The length of leg of the African ostrich is about four feet, and that of its foot ten inches.

Found only at Northampton, east side of Mount Tour, where it is abundant. In one place, there appeared the tracks of four individuals, pointing in one direction, from which it is inferred, that this species was gregareous.



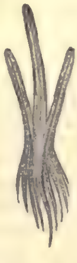
2. *O. Tuberosus.* Toes, three directed forward, each provided with a claw, from one inch to one and a half inches long; with tuberous swellings on the under side, quite distinct; heel very obvious, with three prominences in the middle toe, and two on the others; length of the foot, seven or eight inches. Length of step from twenty-four to thirty-three inches. Found at Northampton; and also at Horse Race, in Gill.

The most important difference between this and the *O. giganteus*, consists in its smaller size. It might be supposed the young of that species; but no intermediate sizes have been noticed; besides the middle toe of the former is larger in proportion to that of the others, than in the latter species, and the toes of the latter are considerably more divaricate than the former.

3. *O. Dubius.* Resembling in its general appearance the *O. tuberosus*, but much smaller, the foot being only four inches long, and the steps twelve inches; probably a distinct species, but uncertain.

Division II.—Septodactyle.

Toes much narrower, and less than in the first division. Some are very slender; they taper gradually to a point, and the claws not often distinctly perceptible.



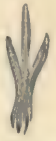
1. *O. Ingens.* Three toes, no visible claw on any specimen yet discovered, toes narrow, tapering gradually to a somewhat obtuse point; quite divaricate; at a few inches behind the heel there is a depression nearly an inch deep, and several inches across; the anterior slopes to which in the rear, appear as if large bristles had been impressed upon the mud. It would seem that the bird possessed a kind of knobbed heel, covered with hairy feathers, which sunk into the mud when the track was deep; impressions of the bristles extending backwards from the heel, from eight to nine inches, producing in all an impression not less than two feet! Length of the foot, exclusive of the hairy appendages, fifteen or sixteen inches. The ordinary step appears to have been about six feet! Found only at Horse Race.

The rock on which the foot prints of this species occur is composed of a fine blue mud, such as is now common in ponds and estuaries; and where the bird trod upon it, in some cases, it seems that the mud was pressed upwards, forming a ridge around the track in front; and so deep is the impression, that it would require nearly the weight of an elephant to produce one of equal depth.

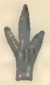
2. *O. Ingens*, variety *minor*. Length of the foot about twelve inches; step from forty to forty-five inches; agreeing in other respects with the *O. Ingens*.

3. *O. Diversus.* Three-toed, with a hairy appendage in the rear; length of foot, independent of the appendage, from two to six inches; length of step from eight to twenty-one inches.

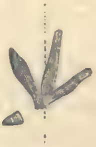
Under this are ranked several varieties from want of sufficient distinctive characters; but all differing widely in point of size, and in the length of step. The following two are considered as varieties only, but sufficiently distinct in form.



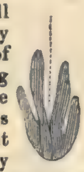
4. *O. Clarus.* Foot, exclusive of the hairy appendage, from four to six inches in length; toes approximate, and acuminate; inner toe shorter than the outer one; hairy appendage very distinct, from two to three inches long; probably with a knobbed heel; step from eighteen to twenty-five inches. Found on the south-west part of Montagu; also at Horse Race, and probably also at Northampton, and at South Hadley Canal. Impressed on a red micaceous sandstone.



5. *O. Platydactylus.* Middle toe from two to three inches long, very gibbous towards the extremity; hairy appendage very large and distinct; length of step from six to eight inches. It differs from *O. Clarus*, chiefly in the swelling of the middle toe, and in its diminutive size.



6. *O. Tetradactylus.* Length of the foot, exclusive of the hind toe, from two and a half, to three and a half inches; toes divaricate, more slender than in *O. diversus;* the hind one, or hallux turned inward, so as to be nearly in the line of the outer toe, prolonged backward; a space remains between the heel and the hind toe, indicating that its insertion is higher on the tarsus than the other toes, and its direction obliquely downwards. Length of step from ten to twelve inches. Destitute of a hairy appendage. Found at Horse Race.



7. *O. Palmatus.* With four toes, all directed forward; the fourth toe very short, proceeding from the inner part of the foot; heel broad; the toes proceeding from it somewhat in pairs; that is, the two inner ones and the two outer ones are closer together, and are less divergent than the two middle ones; toes very slender; foot from two and a half, to three inches long. Length of step eight inches. This remarkable specimen was discovered at Horse Race.

8. *O. Minimus.* Three toed; destitute of a hairy appendage at the heel; foot from half an inch, to an inch and a half in length; toes spreading widely; nearly of equal length; step three to five inches. Found very plentifully at Horse Race. Generally the foot is rather more than an inch long.

The discovery of the gigantic foot-prints of the *O. Giganteus*, is a further proof, that there were animals inhabiting the former world of much larger dimensions than any existing races: the Mammoth may be mentioned as the largest of quadrupeds, and this the largest of birds. In professor Hitchcock's "Report on the Geology of Massachusetts," he shows that the other organic beings, that must have been contemporaries with these immense birds, were their compeers in size; for we find that a Sea-Fan (Gorgonia Jacksoni,) found in the new red sandstone of West Springfield, that has been uncovered without reaching its limits, measures eighteen feet in length, and four feet in width! Indeed, the colossal bulk of these birds is in strict accordance with the early history of organic life in every part of our globe. The much higher temperature that then prevailed seems to have been favourable to a gigantic development of every form of life. See *New Red Sandstone* in the present Supplement.

OTTLEY, William Young, an amateur artist and patron of the arts, was born August 6, 1771, and was the eldest son of Richard Ottley, Esq. of Dunston Park, near Thatcham, a man of considerable fortune. He was duly sent to school, first, at Richmond in Yorkshire and subsequently at Winchester; but he appears to have been emancipated altogether from school at a very early period; for by 1787, we find him to have avowedly adopted the arts as the subject of his studies and the business of his life.

In 1791, with the view of studying in the best field of the arts, he proceeded to Italy, where, practising his own pencil, and the pencil of others whom he employed in taking copies of all that struck his fancy, he became almost domesticated for about ten years. During this time, his propensities as a collector had every opportunity of developing themselves; and amongst a variety of other works of art, which he there became possessed of, is a very interesting series on wood, by the very earliest masters of Italy, of religious subjects, which were removed from the walls of churches at the time the French were in Italy, and thus timely rescued from destruction, by the hand of one who could appreciate their merit and their value to the brotherhood of art. Another extensive collection, which he formed at this period, was that of the original drawings of the best masters of Italy, from the earliest dawning of art down to the splendid days of Raffaele and Correggio, the Caraccis, and Salvator Rosa. Unwilling to retain to himself the sole enjoyment of surveying these valuable tracings of genius, he soon after his return to England, undertook the arduous task of putting forth a series of fac-similes of these drawings in large folio, under the title of the "Italian School of Design," upon which the first engravers and draughtsmen of the day were employed by him. Of this magnificent work, the first part appeared in 1808, and the second about four years afterwards; the third part, which concluded the work rather within the limits originally intended, did not appear till 1823. As it stands, the volume contains eighty-four plates, about one half of which are from the best drawings of Michael Angelo and Raffaelle. This collection of drawings Mr Ottley subsequently parted with to his friend Sir Thomas Lawrence for £8000. His collection of engravings, which he continued to enrich with fresh acquisitions up to within a very few years of his death, is supposed to have been one of the most complete and best selected in Europe. Mr Ottley's other principal works are, the companion-work of the "Florentine School" (1826); the "Origin and Early History of Engraving," (2 vols. 1826), a work well known to all contemporary bibliographers; "the Stafford Gallery; "the Critical Catalogue of the National Gallery;" and the first part of an elaborate "Dictionary of Engravers," (8vo. 1831), for which he had for thirty years been collecting materials, but from the labours of compiling which he was obliged to desist when undertaken at a later period of life; besides various contributions to Rees' Cyclopædia, the Archæologia, and other miscellaneous productions. The last work in which he was engaged, and which, within the last few sheets, he lived to see through the press, was a controversial essay on the conflicting claims of Haarlem and Mentz to the honour of the first use of movable types. His death took place at his house in Devonshire Street, on Thursday the 26th of May, 1836. Three years before this he was elected curator of prints and drawings in the British Museum. His name is entitled to be held in recollection in a threefold character; namely, as an artist, a collector, and a writer on subjects connected with antiquities and the fine arts. As an artist, however, having wielded the pencil only as an amateur, he was comparatively but little known; and that chiefly amongst a select circle of friends, who always found difficulty in prevailing upon him to exhibit any of his performances. The only work of magnitude of his is the "Fall of Satan," eight feet by six, which was exhibited at Somerset house in 1823.

P

PARAGUAY, (*a.*) Paraguay occupies a central situation in the lower portion of the South American continent, the population of which is variously estimated at from 200,000 to 500,000. In 1811, it followed the example of the other Spanish provinces in South America, by declaring itself a free republic, when a new government was constituted under a junta, composed of a president, two assessors, and a secretary. It was soon found that the people—a race of mingled Spanish and Indian blood—were unfit for popular institutions, and for some time the greatest confusion prevailed. The first person who manifested any power of controlling the agitated elements of Paraguayse society, was the individual who officiated in the junta as secretary. This was Dr Francia, one of the most extraordinary despots of modern times, whose death took place in 1838. He was the son of a Frenchman who had settled in Paraguay, where he was born in the year 1757. Destined for the church, he had proceeded so far in the appropriate education, as to become a doctor of theology, but, in the course of his study of the canon law, a latent taste for jurisprudence was awakened in him, and he ultimately became a barrister before his native courts.

The junta, of which Don Fulgencio de Yegros was president, continued to form the government for two years. Francia, the only member of it who possessed abilities, information, or a love of business, was in fact the sole administrator of affairs; the others chiefly spending their time in country sports. Whenever it happened that they interfered to thwart his will, he had only to intimate his intention of retiring, in order to make them give way. It could not be expected that Francia should long submit to a subordinate situation under such circumstances. In 1813, a convention was called to take into consideration the state of affairs. Ignorant of history and of political science, they chanced to possess a copy of Rollin's well-known work, into which they looked for a constitution, as they would have looked into a dictionary for a word. Their fancy was caught by the consular government of Rome, and they resolved to appoint Yegros and Francia as the two consuls of Paraguay. Two curule chairs were provided for these officers, one inscribed *Pompey*, and the other *Cæsar;* and Francia, taking possession of the latter, indicated to all except the unlettered Paraguayse that he should not long be a half ruler. At the end of the first year of the consulate, when the convention again met, he found it no difficult task, by reference to their favourite author Rollin, to convince them that the country was now in one of those critical situations which induced the Romans to entrust the state to a dictator; and he was accordingly elected to that dignity for a term of three years; Yegros vainly attempting to resist the measure.

With the title of "Excellency," and a salary of 9000 dollars—of which, however, he gave back two-thirds, under the pretence that the state had more need of money than himself—he now took possession of the house which had formerly been occupied by the Spanish governor—a step analogous to that of his prototype Napoleon, in removing to the Luxembourg. He became still more austere in his habits—more studious—more thoroughly devoted to business. His attention was particularly directed to the improvement of his little army of about 5000 men; and so eager was he to obtain the reputation of an entire devotion to the good of his country, that, to improve the system of medicine, which had fallen into a low state in Paraguay, he submitted to have experiments tried on his own person. The government was conducted with remarkable energy, and before the expiration of the three years, he had so completely consolidated his power, as to obtain from the convention (1817) a decree constituting him dictator for life.

From this time Dr Francia reigned without control in Paraguay, having the legislative and executive combined in his single person, with the full right which the ancient Roman dictators possessed to dispose of the lives and fortunes of his people according to his pleasure. Soon after his last appointment, he ceased to show any anxiety to cultivate the good will of his subjects. He declared the race of Spaniards to be politically extinct, and interdicted them from marrying white women. Conspiracies were consequently formed against him: he was informed of them before they were matured, and he astounded the Spaniards by an order to appear within three hours before his palace. About three hundred came, and were led into a miserable prison, where several, including the deposed governor, died wretchedly, and from which the rest were not liberated till they had paid a collective fine of 150,000 dollars. He likewise suppressed the Catholic church, and all convents and dignitaries, appointing one vicar-general, a creature of his own, to administer the religious affairs of the people. But his most extraordinary measure was to close up the country against all foreign intercourse, forbidding any one either to enter or leave his territories; his object being, it is said, to prevent the people from being infected with any ideas from without, by which they might be tempted to rebel against his authority. Hence commerce was completely brought to a stand, and much distress unavoidably occasioned, but not without some counter-balancing advantage in the stimulus which was given to the production of all eatable and wearable articles within the province. When the order for non-intercourse was issued, there were about forty foreigners, chiefly merchants, at Assumcion: they were detained there for several years, and only liberated when Mr Canning acknowledged the independence of the South American states. Two Swiss naturalists, Regnger and Longchamps, and the eminent M. Bonpland, the companion of Humboldt, who had entered the country in pursuit of scientific objects, were likewise detained for some years.

The ancient municipalities, and all other vestiges of free institutions, were banished from Paraguay; and the law was administered by a few alcades, removable, of course, at the pleasure of the despot. Francia, indeed, managed every thing, with the assistance of only a few officers or creatures of his own. He planned roads and bridges, commanded and organised the army, conducted the revenues, and thought no details too mean for his attention. He did not encourage public instruction, but neither did he impede it. His authority was supported, during its earlier years, only by exercising great cruelty towards all who were not friendly to it; but when at length his arbitrary proceedings had demolished the strength of the middle and upper ranks, and fairly broke the spirit of the people, he began in some small degree to relent, and he was sometimes heard to say that possibly, in the course of time, a little liberty might be extended to the Paraguayse. Executions merely for the support of his power now ceased, and he began to receive with coldness the tales brought to him by spies and informers. Yet he ever found it necessary to act and move with the greatest caution for fear of assassination.

Francia was not perhaps quite a sane man. His father is known to have been a person of great eccentricity; he had a brother a lunatic, and a sister who was many years deranged; and he himself was subject to occasional fits of hypochondria, bordering on madness. During these times, he shut himself closely up in his palace, vented his ill humour on all around him, and only took pleasure in ordering executions. Of such scenes he was usually a witness from his palace windows.

He had no confidant, no favourite, no friend. The only person he is said to have ever shown any attachment to, was a sister who had charge of his countryhouse. One of his first acts after becoming dictator was to dismiss two nephews he had in the army, merely from a fear lest they should presume upon the relationship. One of them was afterwards confined in irons for four years, for having struck a man who had offended him at a ball, and the other passed a year in the public prison, for having employed one of the military band in a serenade which he gave his mistress. The dictator had for many years taken no part in public worship; he seized, on the contrary, every opportunity of showing his dislike and contempt for the religious observances of his subjects. On a commandant asking him for the image of a saint, that he might place a new constructed fortress under its protection, he exclaimed, "Oh, Paraguayse, how long will you remain idiots! When I was a Catholic, I believed as you do; but now I know that bullets are the best saints you can have on the frontiers." However ruthless and austere, he had at least the merit of Robespierre, that of wishing to make no money by his power; he never accepted a present, and his salary was always in arrear. There was a mixture of imperial state with republican simplicity in his ordinary mode of life. He had at first a body-guard of a hundred men, the tallest and handsomest that could be found; and a small escort of this corps used to ride out with him when he took exercise, for the purpose of driving away all who might be upon or near the way. The body-guard was subsequently dissolved, and he was then content with the protection afforded by detachments of the army.

For several months in the year he resided at the cavalry barracks, which are outside the city, about a league from his usual residence: but then his manner of living was the same, except that he sometimes indulged in the pleasure of the chase. In the apartment that he occupied there were always arms within his reach, or placed upon the table near him; and sabres, the greater number unsheathed, were to be found in every corner. This fear of assassination was also shown in the etiquette prescribed at his audiences. The person admitted dared not approach nearer to the dictator than six paces, until he made him a sign to advance; and even then, he was obliged to stop at a distance of three steps. The officers, even, were not permitted to enter his presence with swords by their sides. He had a most penetrating look, blended with a strong expression of distrust. He wore the official costume, which consisted of a blue-laced coat (the uniform of a Spanish general,) waistcoat, breeches, and stockings, of white silk, and shoes with gold buckles. The dictator was in his eighty-second year. Although his career was marked by great severities, it was not without its beneficial results. He promoted agriculture, originated many useful public works, rebuilt and embellished the capital, created an army, subdued the Indians, and procured respect and tranquillity for his people. It is also not impossible, that, under any other kind of rule, Paraguay might have undergone greater disasters, and witnessed much more bloodshed.

PARCHMENT, (*a.*) Parchment seems to have been rather a scarce commodity until modern times. It was no uncommon thing, in the middle ages, to erase a beautiful poem, or a valuable history, merely for the sake of the parchment or vellum on which it was written. Many of the valuable writings of the ancients have been recovered from beneath a monkish effusion, or a superstitious legend, by carefully following the traces of the pen, or style, which had impressed the former performance upon the membrane; which traces had not been entirely obliterated by the second scribe. Persons who prepared parchment, by erasing a manuscript, were called "parchment restorers;" thus an old French writer says:—Our parchment makers are very skilful. Our parchment restorers are not less so. Some parchment has been restored three or four times, and has successively received the verses of Virgil, the controversies of the Arians, the decrees against the books of Aristotle, and, finally the books of Aristotle themselves. Parchment is like an easy man, who is always of the same opinion as the last speaker.

The preparation of parchment is by no means a pleasant or cleanly operation. Our readers may, probably, have seen carts loaded with sheep-skins proceeding from large markets, or in the vicinity of slaughter-houses. These skins are bought of the butcher by the parchment-maker, in order to prepare, from them, the material in which he deals. The skins are first stripped of their wool, which is sold to the wool merchant, who prepares it for the making of cloth, &c. They are then smeared over with quick-lime on the fleshy side, folded once in the direction of their length, laid in heaps, and so left to ferment for ten or fifteen days.

The skins are then washed, drained, and half-dried. A man, called the *skinner*, stretches the skin upon a wooden frame. This frame consists of four pieces of wood, mortised into each other at the four angles, and perforated lengthways from distance to distance, with holes furnished with wooden pins that may be turned like those of a violin. The skin is perforated with holes at the sides, and through every two holes a skewer is drawn; to this skewer a piece of string is tied, as also to the pins, which being turned equally, the skin is stretched tight over the frame. The flesh is now pared off with a sharp iron tool, which being done, the skin is moistened and powdered with fine chalk: then, with a piece of flat pumice-stone, the remainder of the flesh is scoured off. The iron tool is again passed over it, and it is again scoured with chalk and pumice-stone. The scraping with the iron tool is called *draining;* and the oftener this is done, the whiter becomes the skin. The wool or hair side of the skin is served in a similar manner; and the last operation of the skinner is to rub fine chalk over both sides of the skin with a piece of lambskin that has the wool on: this makes the skin smoother, and gives it a white down or knap. It is left to dry, and is removed from the frame by cutting it all round.

The *parchment-maker* now takes the skin thus prepared by the skinner. He employs two instruments; a sharp cutting tool, sharper and finer than the one employed by the skinner; and the *summer*, which is nothing more than a calf-skin well stretched upon a frame. The skin is fixed to the summer; and the parchment-maker then works with the sharp tool from the top to the bottom of the skin, and takes away about one half of its thickness. The skin being thus equally pared on both sides, it is well rubbed with pumice-stone. This operation is performed upon a kind of form, or bench, covered with a sack stuffed with flocks; and this process leaves the parchment fit for writing on.

The paring of the skin in its dry state upon the summer, is the most difficult process in the whole art of parchment-making; and is only entrusted to experienced hands. The summer sometimes consists of two skins, and then the second is called *countersummer*. The parings and clippings of the skin in the preparation of parchment are used in making glue and size.

Parchment is sold in *rolls* of twenty skins each. The term roll is also employed in law. It is derived from the Latin *Rotulus*, a schedule of paper or parchment rolled up into a cylindrical form. The English probably derived their law term *roll* from the French *rolle;* because legal instruments written on parchment were sewed or glued together, and thus rolled up, whence comes the verb *to enrol.*

Vellum is a kind of parchment made from the skins of young calves: it is finer, whiter and smoother than common parchment, but prepared in the same manner, except that it is not passed through the lime pit.

Parchment is coloured for the purposes of binding, &c. The green dye is prepared from acetate of copper (verdigris), ground up with vinegar, with the addition of a little sap green. Yellow dye is prepared from saffron; a transparent red from brazil wood; blue from indigo, ground up with vinegar; black from the sulphate of iron and solution of galls. *Virgin parchment*, which is thinner, finer, and whiter than any other kind, and used for fancy work, such as ladies' fans, &c., is made of the skin of a very young lamb or kid.

Parchment forms a considerable article of French commerce. It is made in most of the cities of France, and vast quantities of it are imported into England, Flanders, Holland, Spain, and Portugal.

PARIS BASIN. This was the first tertiary formation minutely examined, and the researches of Cuvier and Brongniart in this locality gave a new impulse to, and introduced a new era in geological science. The area called the Paris Basin, extends in length to 180 miles from north-east to south-west, and about 90 miles from east to west. This space is a great depression in the chalk, which has been filled up by alternating groups of marine and fresh water strata. Cuvier enumerates the following groups:

1. Fresh water formation,	Plastic clay. Signite. First sandstone.
2. First marine formation,	Calcaire grossier.
3. Second fresh water formation,	Silicious limestone. Gypsum, with bones of animals. Fresh water marls.
4. Second marine formation,	Gypseous marine marls. Upper marine sands and sandstones. Upper marine marls and limestones.
5. Third fresh water formation,	Silicious millstone without shells. Silicious millstone, with shells. Upper fresh water marls.

Cuvier supposed that these formations had been at successive periods deposited over the chalk, and that, consequently, the land had been alternately submerged and elevated above the waters of the ocean. Subsequent investigations of Prevost and others have demonstrated, however, that in all probability the strata were deposited in a gulf, at one extremity of which the sea entered; and at the other a large river, while other streams may have flowed in at different points, and thus gave rise to the alternating mixture of marine and fluviatile remains, which are ever found associated together.

The *Plastic Clay*, No. 1, and marls, are found both in the upper and lower beds, and contain fresh water shells, lignite, and drift wood, evidently the deposit of a large river entering the basin. This deposit, as might be expected, is of partial extent throughout the area of the basin.

The *Calcaire Grossier*, No. 2, is a coarse limestone, often passing into sand, such as may partly have been derived from the debris of the subjacent chalk. It contains 400 distinct species of shells, both marine and fluviabile; many of these are greatly comminuted, but others are entire and perfect. Of these, 137 species are of the genus

Cerithium, animals that are known to inhabit the mouths of rivers running into the sea, where the water is of a brakish quality.

The Calcaire silicieux, No. 3, is a compact silicious limestone, resembling a precipitate from the waters of mineral springs. It is often traversed by small empty sinuous cavities; is for the most part devoid of organic remains, but in some places contains fresh water and land species, and never any marine fossils. This limestone occupies a distinct part of the basin, from the calcaire grossier, although at their thinner edges they alternate with each other. The gypsum and marls, supposed by Cuvier to be of subsequent origin to the beds already enumerated, are found by Prevost to alternate repeatedly with them. The gypsum and marl beds are in greatest abundance towards the centre of the basin. In these beds, the skeletons of sixty-three mammalia have been found together, with seventeen species of reptiles and birds. Of the mammalian quadrupeds, thirty-two are hoofed animals, non-ruminating; twelve are ruminating animals; seventeen are of the rodentia or gnawers; eight are carnivorous; two are edentata or toothless, of the sloth genus; and two amphibious.

The Second or Upper marine formations, No. 4, consists of marls and micaceous and quartzon sand, upwards of eighty feet thick.

The Third fresh water formation, No. 5, consists of marls interspersed with beds of flint and flinty nodules, one set of flinty layers containing a number of fossils, the other none.

PATRONAGE. In the ecclesiastical law of Scotland, a patron is one who enjoys, along with other rights of less importance, the right of presenting a parochial minister to a vacant charge. It would appear, that patrons were originally merely the guardians of the temporal property of particular churches; and that the rights afterwards attached to patronage were at first conceded by the church, only to those who endowed particular churches, with a view to encourage the practice. Afterwards, however, similar rights in reference to other churches, were assumed by persons of influence in the neighbourhood; and while the Roman Catholic religion prevailed, the pope, and since the Reformation, the Crown, has claimed to be considered patrons of all churches in regard to which no right of patronage could be shown by individuals. In addition to the right of presentation, the patron in former times had a pre-eminent seat, and a burial-place in the church, and a right of precedency in processions; his name and arms were engraved on the church, bells, &c. He had also the disposal of the fruits of the benefice during a vacancy, and his consent was necessary to the validity of leases or feus by the incumbent. The vacant stipends now go the ministers' widows' fund. The statute 1567, c. 7, which abolished Popery, and recognised the Reformed religion, reserved "the representation of laick patronages," by "the just and auncient patrones." And, in still broader terms, the act 1592, c. 110, provided that the presbyteries to whom all presentations were thereby appointed to be directed, "be bound and astricted to receive and admit quhatsumever qualified minister presented be his majesty or laick patronis." The act immediately succeeding, (c. 117,) declared, in reference to benefices rendered vacant by the deposition of the incumbent, that, if the presbytery refused a minister presented by the patron, the latter should be entitled to retain the fruits of the benefice. On the establishment of Episcopacy, the principle of these acts was adopted in the act 1612, c. 1, by which presentations were appointed to be directed to the bishop of the diocese; and it was provided that, if the bishop should refuse to admit a qualified minister, still undeprived, it should be lawful for the patron to retain the fruits of the benefice; and that, if no sufficient reason should be given for refusal, letters of horning should be issued, charging the ordinary, (i. e. the bishop) to do his duty in receiving and admitting the presentee. Some time after the re-establishment of Presbytery, patronage was abolished by 1649, c. 23, which empowered presbyteries to settle ministers "on the sute and calling, or with the consent of the congregation, on whom none is to be obtruded against their will." At the Restoration, the act 1649 fell under the rescissory act. But patronage was again abolished by 1690, c. 23, and the right of election for the approval of the congregation given to the elders, with the heritors, or the magistrates in burghs. As compensation, patrons were to receive 600 merks, (£33 6s. sterling;) on receiving which, they were bound to execute a deed of renunciation of the patronage. Only three parishes (Cadder, Old and New Monkland) had obtained effectual renunciations, when the right of patrons to present was again restored by 10 Anne, c. 12, which declared, that it should be lawful to all patrons, who had not executed renunciations in terms of the former statute, to present as formerly, and that presbyteries should be bound to admit the qualified presentees, as presentees ought to have been admitted before the passing of the act. This act is still in force, and at present, accordingly, the first step in the settlement of a parochial minister, is the presentation by the patron. But the presentee must, before he acquires a right to the stipend and other emoluments of his office, be admitted to it according to the rules of the church. By the act of the General Assembly 1835, it is provided, that no one shall be admitted a minister, if a major part of the male heads of families, communicants, dissent from his call. This act has, in a recent decision of the Court of Session, been considered *ultra vires* of the General Assembly; a majority of the whole Court of Session holding that the presbytery were acting illegally in refusing admission to a presentee, in conformity with the terms of it; earl of Kinnoul *v.* presbytery of Auchterarder, 8th March, 1838. The decision was confirmed by the House of Lords.

Patronage is an heritable right. But it is naturally a *jus incorporale*, transferable by disposition without infeftment. It is, however, capable of being feudalised, after which it can be completely conveyed only by infeftment. The usual symbols are a psalm-book, and the keys of the church. It was held that patronages were not included in the act of annexation, 1587. Lords of Erection were held entitled to exercise a right of patronage, by presenting ministers to the several churches attached to the erected benefices. The crown, as already said, has right to all patronages to which no title can be proved; and hence, in a question with the crown, the failure of a subject to prove his title, establishes the crown's right. A right of patronage cannot be lost by mere neglect to exercise it. There must be contrary positive prescription. A right of patronage may be made the subject of a liferent provision, by way of locality to a widow, and she will have right to present during her life. The magistrates of a royal burgh cannot alienate the patronage of a church within burgh. Where a patronage is given to one in liferent, and another in fee, the liferenter is entitled to present. Where, however, (as may be validly done,) the patronage is conveyed to the heritors of a parish, fiars only are understood to be meant. A presentation by a married woman must have the concurrence of her husband. A tutor may present to the churches of which his pupil is patron; and minors may present, their curators, if they have any, giving their consent. A patron cannot present himself to the benefice. The exercise of the right of patronage may sometimes give rise to questions of right; and it may be difficult to determine whether the civil or ecclesiastical courts have jurisdiction in these questions. The judgment of the church courts is absolute in determining the fitness of the presentee for the pastoral office; but the Court of Session has the primary and exclusive jurisdiction in questions relative to the validity of the presentation. Although, however, a presbytery should erroneously reject a valid presentation, or refuse to settle a presentee on grounds not cognisable by them, they cannot be compelled to settle him by civil diligence, which the act 1612, c. 1, empowered a patron to employ against a bishop who refused to collate a qualified presentee. A person may be admitted by the presbytery to the pastoral office; but without a valid title to the benefice, he is not entitled to the fruits. Accordingly, when a presbytery reject a presentation, and, pending proceedings in the civil courts for determining its validity, settle another minister, that minister is not entitled to draw the fruits of the benefice. It would appear that in such a case the Ministers' Widows' Fund would be entitled to the stipend, as vacant stipend. The law of patronage, including Calls, *Jus devolutum*, the Settlement of ministers, &c., has been ably digested by Mr Dunlop in his separate treatise on patronage, (1833.) For further information on subjects connected with the constitution of the church of Scotland, see the article *Assembly, General*, in the body of the Encyclopedia; also the article *Scotland*, subdivision *Church*.

PEARSON, Richard, M. D., an eminent physician, was a native of Birmingham, where he was born in 1765. Agreeably to his own wishes, he was designed for the medical profession, for which he had cherished an early attachment, manifested even in his boyhood by a taste for botany and an insatiable curiosity to understand and examine the structure of animals. Accordingly, at the usual period, he entered upon the study of medicine, under the tuition of Mr Tomlinson, an enlightened practitioner in Birmingham; nor was he long in justifying his choice of a profession, and affording an earnest of his future excellence therein; for, in the first year of his noviciate, a gold medal, being the first proposed by the Royal Humane Society, for the best dissertation on the signs of death with reference to its distinction from the state of suspended animation, was unanimously adjudged to him. He afterwards studied at Edinburgh, at that time in the zenith of its fame as a medical university, and he obtained in 1786, his degree with honour. Here he numbered among his college friends, Sir James Mackintosh, Dr Beddoes, Dr Duncan, and other equally eminent men; and, besides the usual course of medical study, he acquired great proficiency in natural history and botany, two sciences which powerfully influenced the bent of his subsequent professional studies, and were ever after among his favourite and unwearied pursuits. After two more years, which were spent on the continent, in Germany, France, and Italy, he settled as a physician in his native town, Birmingham. Here, by the influence and recommendation of his attached friend, Dr Withering, he soon succeeded that eminent practitioner and botanist as one of the physicians to the General Hospital, and began to devote his active and well-stored mind to the zealous exercise of his profession, in which he very early acquired a high reputation, and was enjoying an extensive and rapidly increasing practice, when he was induced, in the year 1800, to take up his residence in London. His published works, during his continuance in Birmingham, a period of about twelve years, consisted of three dissertations, one on phthisis pulmonalis, another on hydrophobia, and the third on the epidemic bilious fever in 1798. In London he published his "Observations on the Epidemic Catarrhal Fever, or Influenza, of 1803," which rapidly passed through many editions; and, in the following year his outlines of a plan for arresting the progress of a malignant contagion which was raging on the shores of the Mediterranean, and hourly expected in England, increased his reputation, and gained him the notice of the highest individuals both in and out of his profession. But the work which above all established his fame in the medical world, and for which few were so well qualified, by an extensive acquaintance with natural science as himself, was his "Practical Synopsis of the Materia Alimentaria and Materia Medica," the first part of which had appeared anonymously so early as 1797.

From this time Dr Pearson took his place among the most distinguished members of the medical profession in London. His co-operation was solicited in the principal literary and scientific productions of the time, and he was enrolled a fellow of most of the learned societies in London,—the Medical and Medico-Chirurgical, the Linnæan, the Antiquarian, and others. By the earnest desire of the editor, the late arch-deacon Nares, he contributed the medical reviews for the British Critic; for a certain period he furnished the articles on Medicine in Dr Rees's Cyclopedia, and was associated with the celebrated Dr Hutton and Dr Shaw in the abridgment of the Philosophical Transactions from their commencement. While still in the enjoyment of a metropolitan reputation, he left London, and after a short residence at Reading, and afterwards at Sutton among his relations and friends, he again returned to Birmingham, where he passed the remainder of his life. His object in thus repairing to his native place being not so much the desire of practice, as of a retirement where he could enjoy the pleasures of medical society, little remains to be said of his professional career, except that several of those families who had formerly confided in him, both in the town and in the country, were happy in the opportunity of consulting him, and not a few medical men gladly availed themselves of his acknowledged experience. On the opening of the medical school in Birmingham, he delivered the first introductory lecture; and to the success of it his subsequent courses of lectures, were highly instrumental. The last professional acts of his life were, a paper communicated to the Edinburgh Medical Journal, on the preference to be given in medicine to the seeds over the other parts of plants, where the former were found to possess equal medicinal properties; and a tract in illustration of the principle, published in his last illness, on the medical properties of the seeds of the Spanish broom. Dr Pearson's death took place at Warwick, on the 11th of January, 1836. In private life, he was an affectionate father, and a warm and steady friend. With great independence of thought he united perfect charity. His unusual conversational powers were marked by a cheerful readiness to impart to all ages his varied information. His benevolence was unbounded, and displayed itself daily and hourly,—to the poor by open-handed generosity, to his friends by unceasing acts of kindness, and to all mankind by his constant endeavours to promote every thing which could benefit the human race.

PEEBLES-SHIRE, OR TWEEDDALE, a county of Scotland, bounded on the north by the county of Mid-Lothian, on the south by Selkirk-shire and Dumfries-shire, on the east by Selkirk-shire and Mid-Lothian, and on the west by Lanarkshire. Its extreme length, from north to south is about thirty miles; its greatest breadth from east to west is about twenty-two. It is a hilly pastoral county, the general elevation of the pasture-lands being about 1200 feet, yet these are mostly covered with green herbage, and on the banks of the streams are many fertile spots. The river Tweed rises in the south-western extremity of the county, and flowing first north-east and then east, divides it into two nearly equal parts. The other streams of the county are, the Biggar, the Lyne, the Eddlestone, the Leithan, the Mannor and the Quair, which all fall into the Tweed; and the North and South Esk, which fall into the sea at Musselburgh. Peebles-shire is deficient in minerals, particularly coal, which circumstance accounts in some measure for the absence of any considerable manufacture in the county. The population is thinly scattered, and mostly engaged in agricultural and pastoral pursuits. The number of sheep which pasture in the county is estimated at above 120,000. The majority of these are of the Cheviot breed, which has of late years supplanted the old Tweeddale variety, being found more valuable for its fleece. The county has only one town, Peebles, and a few villages, namely, Linton, Eddlestone, Skirling, Broughton, and Innerleithen, the latter place celebrated for its mineral waters, which are said to be good for the cure of old wounds, diseases of the eyes, and for relieving stomach and bilious complaints. The *town of Peebles* is situated twenty-one miles south from Edinburgh, and is of great antiquity as a seat of population. It seems to have been occasionally visited by the Scottish sovereigns in their hunting excursions, and one of our finest old Scottish descriptive poems, "Peebles to the Play," attributed to the first James, celebrates a festival which annually took place at Peebles on Beltane day or the first of May. Peebles is divided into an Old and New Town, and is bounded on the south by the Tweed, on the north by the Eddlestone water. The inhabitants are chiefly employed in hand-loom weaving, fishing, country labour, &c. The town, from its interesting and healthy situation in a pastoral district, its excellent seminaries, and other advantages, is often selected as a place of residence by families in easy circumstances. Population of the burgh and parish in 1841, 2632; of the county, 10,499.

PEMBROKESHIRE; a maritime county in South Wales, surrounded by the sea every where except on the eastern side, which is bounded by Carmarthenshire and Cardiganshire. Its extreme length is thirty miles, and its greatest breadth twenty-seven. It forms the most level portion of Wales, the hills being all of moderate elevation. The principal rivers of the county are the Tivy, and the Eastern Cleddaus and Western Cleddaus. These two latter unite, and form the excellent estuary of Milford Haven. The agriculture of the county is in general in a backward state, but great numbers of black cattle and sheep are reared and sent to the south of England, where they are much prized for their flesh. The manufactures of the county are trifling, but coal is largely exported, and there are a number of fishing-towns along the coast. The inhabitants of Pembrokeshire are divided into English and Welsh. Between the two classes, in former times, great animosity and a complete separation existed, but intermarriages are now frequent. Between Milford Haven and St George's channel, where the English live, a colony of Flemings was permitted to settle in the reign of Henry I. and the district is commonly called Little England beyond Wales. The English language is admitted to be here spoken with great purity. The towns of Pembrokeshire, with a population above 2000, are, Pembroke, 7412; Haverford West, 5941; Narberth, 2670; St David's (city) 2413; Tenby, 2912; and Dogmels, 2478. *Pembroke*, the county town, stands on a singular neck of land, dividing the small estuary of Down Pool, which flows from Milford Haven. It is 250 miles from London, and 10 from Haverford West. It was once defended by strong walls and a powerful castle, the ruins of which still remain. The town consists chiefly of one long street, which is wide and well-built, extending from east to west on the ridge of a hill, and terminating at the west end in a steep precipice, on which the castle is situated. The county assizes and elections are held here, and there is a considerable market on the Saturdays. Population of the county in 1841, 88,044.

PENANG, OR PRINCE OF WALES' ISLAND,* an island of the Indian ocean, situated on the west coast of the Malayan peninsula, in latitude from 5° 15′ to 5° 29′ north, and longitude 100° east; its greatest length is sixteen statute miles from north to south, and its greatest breadth twelve miles at the north, and decreasing to eight miles at the south, thus forming an irregular four sided shape, with a range of lofty hills in the centre, the whole computed to contain 160 square miles. The valley of Penang, about three miles in breadth, is the level part of the island on its eastern side, extending from the hills to the sea, of a triangular shape, the ranges of mountains forming the base and the apex, called Tanjong, jutting into the harbour, and having George Town (the capital) and the Fort of Penang built on it, on which, for three miles in every direction from the point, private houses extend. Almost the whole of the northern shore is mountainous, and through the centre of the island runs a range of hills, decreasing in height and magnitude as they reach towards the south. On the west and south of the mountains there is a considerable quantity of level ground of good quality for every species of cultivation, as is now demonstrated by the general culture thereof. Indeed two-thirds of Penang is of level or gentle inclination. The east, owing to its moistness, is covered with rice fields; the south and west valleys, though partly cultivated for the same purpose, are chiefly laid out in pepper gardens and spice plantations. Every where close to the coast, as in Ceylon, runs an extensive belt of cocoa-nut trees, and scattered over the island in various groups appear groves of the graceful areca palm (or Penang) from which the isle takes its Malay name. The hills and low grounds, where not cultivated, are thickly covered with wood. Vegetation is splendidly luxuriant, and for miles the eye rests on one dense mass of mountain forest. Besides George Town (the capital) above alluded to, there is only one large collection of houses entitled James Town, situated on the sea shore, four miles to the south of the capital, amidst a grove of the lovely palm tribe. Numerous small villages and Malay topes are scattered over the island, especially on the south side, often beautifully and romantically situated on the coast or amidst spice groves in the vales.

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* Abridged from "The British Colonial Library," by R. Montgomery Martin, Esq.

The harbour of George Town, the capital, is capacious, with good anchorage, and well defended; it is formed by a strait about two miles wide, that separates Penang from the opposite Quedah coast on the Malayan peninsula, and the whole navy of Great Britain might find shelter therein. The sea is placid throughout the year, and the periodical effects of the monsoons little felt, the winds partaking more of the character of land and sea breezes. When first known to Europeans, the island appeared quite untenanted, covered with forests, and considered as a part of the possessions of the king of Quedah on the contiguous coast. In 1785, captain Light, the commander of a "country ship" in India, having married the king of Quedah's daughter, received a gift of the island as a marriage portion. Captain Light transferred it to the East India Company, who having entered into a treaty with his Quedah majesty agreed to pay 6000 dollars annually to the king, which in 1800 was raised to 10,000, in consideration of the Company receiving the Wellesley province on the main land opposite Penang, a territory extending thirty-five miles along the coast, four miles inland from the south bank of the Quaila Mudda to the north bank of the Krian river, latitude 5° 20′ north.

When the Company's establishment was formed at Penang, in 1786, the only inhabitants were a few miserable fishermen on the sea coast. In consequence of the disturbances in the Malayan principalities, and the encouragement given to settlers by the East India Company, a native population of various descriptions arose. The population of the settlement, including province Wellesley and adjacent isles, has been as follows, during the years—

1821 . .	38,057	1826 . .	55,116
1822 . .	51,207	1827 . .	57,986
1824 . .	53,669	1828 . .	60,551

The bulk of the inhabitants consists of Malays, Chulias, Chinese, Bengalese, Burmese, &c., the Europeans and their descendants forming only about five hundred.

The trade of Penang is carried on with Calcutta, Madras, Bombay, England, China, Java, Ceylon, Siam, Tenasserim coast, Acheen, Delhi, Quedah, and a few petty native ports. The total value of imports into Penang were—

In 1828-9	S. rupees 52,23,872
Exports from ditto	36,00,900
Excess . .	16,22,972

The imports and exports of specie for the same year were—

Imports	S. rupees 8,32,232
Exports	7,19,896
Excess . .	1,12,356

Of the imports, opium alone consists of upwards of seven lac of rupees; the other items are comprised of the various produce of the Straits, or of India and British goods, the trade being one of transit. Birds' nests for Chinese soups is one of the most important articles.

Penang has been a spice island from the period nearly of its first settlement. Pepper engrossed the consideration of capitalists for many years, and until the price fell so low that the returns no more than repaid the outlay. But previous to this check another resource of gain opened by the introduction to the island of the nutmeg and clove tree. In 1798 a few spice plants were imported from the Dutch spice islands; but in the year 1800 there were brought from Amboyna 5000 nutmeg and 15,000 clove plants. In 1802 a further and larger number arrived. This consisted of 25,026 seedling nutmeg trees, and 175 plants of ages varying from four to seven years. Shortly before this last period a government spice garden had been established, embracing 130 acres of land, lying on the slopes which skirt the base of the hill near Amie's Mills, a romantic spot, and well watered by a running stream now called Ayer Putih. This plantation, in some respects a mere nursery, contained, in the above year, the number of 19,628 nutmeg plants, varying from one up to four years old, 3459 being four years of age. There were also 6259 clove trees, of which 669 were above six and under seven years old. In the same year, 1802, Mr Smith, the honourable Company's botanist, reported that he had imported in all to the island at that date 71,266 nutmeg and 55,264 clove plants, out of which a few were reserved for the botanical gardens at Kew, Calcutta, and Madras. Most of the plantations now in a productive state have been created by plants raised from nuts yielded by trees of the original importations, and a number of nutmeg trees which had been planted on the face of a hill and abandoned, were, after a lapse of about four years, rescued from thick jungle and found to be in a lively condition and in bearing. The wild nutmeg tree is indigenous to Penang, being an inhabitant of the hills. It is a tall forest tree, and bears a more oval shaped fruit than the true nutmeg tree. Both the nut and mace are less pungent and more astringent than the true spice, yet the Chuliahs have been in the habit of gathering them and selling them in the native bazaars.

In 1818, the bearing nutmeg trees on the island were estimated to be 6900. Since that period spices have been more extensively cultivated. There are now upwards of thirty spice plantations at this settlement, including province Wellesley, and these may be classed as follows:—Five plantations containing from 4000 up to 20,000 trees. Eight from 500 up to 10,000 trees. Seventeen from 50 up to 2000, containing in the aggregate about 8,000 trees, of which number 45,000 are estimated to be in bearing. When Bencoolen was ceded to the Dutch, the plantations there were estimated to contain 25,000 bearing trees only. The gross annual produce from the plantations may be roughly estimated at 130,000 lbs., but young trees are yearly coming into bearing to swell this quantity; should the cultivation meet with no serious interruption, it may perhaps in time supply the whole of the English market with spices.

The government of Penang, Malacca, and Singapore, is subordinate to the presidency of Bengal. As a commercial and maritime station Penang has many advantages; it serves as an entrepôt for the various produce of China, the eastern islands and straits, the native merchants from which take back in return British and India goods. It was at one time contemplated to form an extensive arsenal and ship-building depot at Penang, and indeed several fine ships were built there, but the object was ultimately abandoned. At present Penang serves as a rendezvous for our naval squadron in the Indian seas, for which its position, healthiness, and abundance of provisions, admirably qualify it.

PENCIL, (*a.*) The marking material of what are called black-lead pencils is plumbago, or graphite, a compound of carbon and iron, in the proportion of nine parts of carbon to one of iron. This mineral is of a dark iron-black colour, passing into steel gray. It occurs in a massy form, in kidney-shaped lumps, varying from the size of a pea to much larger lumps, and is found in beds of quartz, and in masses of calcareous earth. It has a glistening metallic lustre, and the fracture presents a texture somewhat between scaly and granular. The large masses are slaty in their appearance, and occur generally in distinct concretions. It takes a considerable polish by rubbing, and, as is well known, gives a dark lead-gray streak when drawn along paper or wood. It is unctuous to the feel and not very brittle, and about twice as heavy as its own bulk of water. The large quantity of carbon which it contains, renders it peculiarly fitted to the purposes of the chemist, in the form of crucibles, as it will bear an intense heat. The other purposes to which it is applied, are to relieve friction in the axes and pivots of wheels. Its power this way may be illustrated by rubbing a button first on a plain board, five or six times, and applying it to a bit of phosphorus, the latter will immediately burn. When rubbed on a surface covered with plumbago, double or treble the friction will be required to produce the same effect. Plumbago is also used to give a polish to shot and gunpowder, to give a preservative coating to cast iron, and to mix with clay to form a lining for furnaces. At North Carolina shingles are coated with a mixture of black lead and oil, which is said to be an excellent preservation against fire. For all these latter purposes, however, coarse and impure black lead is employed.

There is only one mine of plumbago in England. It is situated at Borrowdale on the side of Seatallor Fell, a lofty mountain in Cumberland, about eight miles south of Keswick.

In the reign of Elizabeth there was a mine of copper and lead in the immediate vicinity, which was worked by some Germans; but on finding some small veins of gold and silver in the mine, a contest arose with the crown as to who should possess the precious metals; Elizabeth gained the contest, and the Germans soon afterwards left the country. About that period, however, the Borrowdale black-lead mine was discovered, and soon drew attention to its valuable contents. Its celebrity gradually increased, and with it an extensive system of purloining. Sometimes the workmen in a neighbouring mine would cut through into the black-lead mine and carry off quantities of the contents. At another time a party of miners overcame a guard placed at the entrance of the mine, and kept possession of the whole place for several days. An act of parliament was obtained in the last century, inflicting severe penalties on all depredators, and since then an improved mode of protection has been devised.

The entrance to the mine is about 1000 feet from the level of the ground, from which spot there is an excavated cavity, extending 660 feet horizontally into the body of the mountain; this passage has a railway laid along its whole length, and is used to convey the ore from the bowels of the mountain to the entrance.

Mr Parkes, who visited the mine in 1814, gives the following account of it:

"There two entrances to the mine,—a small one by which the workmen descend by means of a flight of steps, and the other is a large horizontal one, capable of admitting hand-carts and wheelbarrows for the removal of the rubbish and loose earth by which the black lead is enveloped, and through this entrance the water passes off which constantly runs through the mine. In order to secure the vast treasure which is contained within this mountain, the proprietors have now erected a strong brick building, consisting of four rooms on the ground floor, one of which is immediately over the opening by which the workmen enter the mine as they go to their work. This opening is secured by a trap door, and the room connected with it is called the dressing room, for when the men enter it, they strip off their usual clothes, and each of them put on a dress suitable for working in a mine. The men work six hours each, and then they are relieved by others. As the black lead is cleaned, it is put into firm casks which hold about one hundred and twelve pounds each, and these are sent by waggon to the warehouse of the proprietors in London. Formerly, this mine was opened but once in seven years: but in consequence of the demand being greater, and the quantity which they have discovered not being so large, it has been found expedient to open and dig for ore during six or seven weeks every year. During this time the mine is guarded night and day. In consequence of the mines having been opened in late years every summer, they now raise all the black lead they find, and then the mine is securely shut in the following manner:—The workmen wheel back the rubbish which had been removed at the opening of the mine, and this is laid on in a continued heap, to the amount of some hundred cart loads, which securely blocks up both the passages into the mine. The door is then locked as well as the door into the house, and all the men thus leave the premises in a state of safety; for the mass of rubbish which is thus wheeled in at the large door, dams up the small rill of water which usually flows through the mine, and thus has the effect of flooding it completely. Thus, if an attempt were made to break the house and enter the mine by that road, the robbers would find that the water had risen to such a height as would drown any individual who should attempt to search for the ore."

Readers may be surprised at the extreme caution displayed in every part of these processes, as described by Mr Parkes, to prevent purloining, &c., but this surprise will cease when we recollect the value of the ore; the market price of the best black lead being nearly half the price of pure silver, about two guineas per pound. Various shafts are excavated in this mine, some of which appear to be exhausted, which occasions a search for new veins in other directions. One mass was discovered in 1803, measuring twenty-one yards and a half in length, and two and a half in diameter.

The property of this mine is shared between a few individuals, and to show its great value, Mr Parkes states that in sixteen years, from 1798 to 1814, 2552 casks, of one hundred and twelve pounds each, were procured from this mine: of which 736 were fine, and 1816 coarse. This we shall find to give an average, one year with another, of 17,864 lbs.; indeed, the nett profits have been known to be between 20 and £30,000 in one year. The reason why this mine is so particularly valuable, is to be found in the circumstance that the ore requires scarcely any labour to fit it for the market, it being originally almost in a pure state.

Perhaps one of the most remarkable circumstances connected with plumbago is the mode in which it is sold. After the quantity necessary for supplying the market during the ensuing year is extracted from the mine, and the latter closed up, the product is carried in small fragments of about three or four inches long, to London, where it is exposed for sale at the black-lead market, which is held on the first Monday of every month, at a public house in Essex street, Strand. The buyers, who amount to about seven or eight individuals, examine every piece with a sharp instrument to ascertain its hardness, those which are too soft being rejected. The individual who has the first choice pays forty-five shillings per pound, the others thirty shillings. But as there is no addition made to the first quantity in the market during the course of the year, the residual portions are examined over and over again, until they are exhausted.

Thus much for the black-lead. The wooden case or exterior of black-lead pencils is usually made of cedar. Of cedar-trees there are many varieties, but the red cedar used for pencils is the Virginian cedar, (*Juniperus Virginiana,*) of North America.

To prepare the cedar for the pencils, it is cut by a circular saw into four-sided strips of a proper length, and are so arranged as to thickness that two of them together form a square of which one piece is thicker than the other, so as to admit the groove cut to receive the lead, to be confined to one piece only—this groove being made by a common plough plane.

The lumps of plumbago are cut into slices about the thickness of a shilling, by a thin circular saw; the slices being of various sizes, from one to two inches long, and varying in breadth.

In preparing the cylindrical leads for the "patent" pencil cases, for which Mr Mordan took out a patent, the plumbago slices are cut into square prisms a little larger than are ultimately required; and these prisms are brought to the desired cylindrical form by a gradual process of change, produced by an ingenious contrivance. A series of three different sized circular holes are cut in pieces of ruby; the first of which is of such a size as to convert the square prism of black lead into an eight-sided prism, by cutting off the sharp edge: this eight-sided prism is then converted into one of sixteen sides, by thrusting it through the next smaller hole: and lastly, the cylindrical form is given by the third hole which is just the size required. The manner of thrusting out the lead in a "Mordan's" pencil case with a little pin inside, will give a good idea of the action of the wire and tube in the above process.

The rubies are worn out in three or four days. Steel does not last above as many hours. So that the ever-pointed pencils are necessarily costly, six of them being sold for 2s. 6d. If they are cheaper than this we may be sure that they are adulterated. In Paris, when you buy a sheet of paper in a stationer's shop, some of these pencils are added to the purchase. Now these are formed of a mixture of plumbago, fuller's earth and vermicelli.

There is no patent which has been more infringed on than that of Mordan's, for ever-pointed pencils. Birmingham is the source of this infringement, where they are sold as low as three farthings each, formed of composition. A thousand persons are now engaged in the manufacture of these pencils and cases.

To return to the cedar pencils:—One edge of a slice of plumbago being made straight and even, it is dipped in glue, and inserted into the groove cut in the thicker half of the cedar stick. With a sharp tool a cut is made on each surface of the slice, close to the wood, and the piece can then be broken off, leaving a little prism of lead in the groove. The straight edge of the slice is again dipped in glue, and inserted at the end of the first piece, and again cut off, till the whole length of the groove is filled. The surface of the wood is then smoothed down level, and the other half is glued on, thus making a square black-lead pencil.

The square pencil is brought into the cylindrical form by passing it through a hole in an iron or steel puppet of the exact size of the pencil, and forced along by the workman. On the other side of this puppet is a revolving apparatus, which cuts the pencil round; it consists of two guages and a small plane iron, revolving round an open centre. Beyond this is a cylindrical hole in a steel plate; as soon, therefore, as the first edge of the pencil is cut round, it is forced into this circular hole, and before the workman has lost the means of pushing it forward at the end that is square, the cylindrical end is pushed through the circular hole, so as to enable him to seize it with a pair of wooden nippers. It is thus pushed and drawn entirely through, and comes out cylindrical and polished, for the hole being a little smaller than the pencil, the latter is compressed in the act of passing through.

The pencils usually hawked about the streets of London are made with the powder of black lead, mixed with melted sulphur, and then poured into moulds, which are frequently reeds or rushes. Common carpenter's pencils are formed in this way, and answer well enough for the purposes to which they are applied. This mode, however, relates to those common pencils in which the lead (so called) is unusually thick; but the most successful attempt at deception is where the pencil has all the outward form and semblance of being well made, but where a process of anatomization shows the purchaser that the amount of black lead is marvellously small,—the central part of the groove being filled with a different substance. In common pencils, gum-arabic and resin are often mixed with the plumbago.

Genuine cedar pencils must cost at least sixpence each. Pencils of a spurious kind are however, sold as low as 4½d. per dozen. The melting or softening of the lead when held in a candle, or applied to a red-hot iron, and yielding a blueish flame with a strong smell like that of burning sulphur, will at once detect the nature of their composition. Pencils so made are of a very bad kind; they are hard, brittle, and do not cut or make a mark freely, either on paper or on wood, rather cutting or scratching them than leaving a coloured stroke.

Drawing pencils are distinguished by the hardness or softness of the selected specimens of plumbago from which they are manufactured, and, accordingly, those made from the hard mineral, have H or H H stamped upon the cedar, and those of a soft or very soft nature are distinguished by B or B B, technically, however, B and double B, as in the former case H and double H.

Black-lead pencils appear to have been known for nearly two centuries, for a writer of about 200 years ago, says,—"Of late black lead is curiously formed into cases of deal or cedar, and so sold as dry pencils, something more useful than pen and ink."

PENRITH; an ancient market-town in the county of Cumberland, situated near the river Pellerel on the north, and the confluence of the Emont and the Lowther on the south, 284 miles from London, and 17 from Carlisle. During the wars between England and Scotland, Penrith frequently changed masters, and in the rebellion of 1745, the Highlanders quartered here. In the church-yard are shown two stone pillars of unknown antiquity, called the giant's grave, and a single stone called the giant's thumb. There are some manufactories here of woollen and cotton goods, and markets are held on Tuesdays and Saturdays. Population of town and parish in 1841, 6429.

PENS, WRITING PENS, (*a*.) The principal birds from which quills are obtained for making pens are the goose, the swan, and the crow. Pelicans also furnish a portion of quills. In 1832, the number of quills entered for home consumption was 33,668,000, the greater part of which came from the Netherlands and Germany. Immense quantities are also imported from Russia and Poland, where flocks of geese are kept for their quills alone. A goose, properly managed, furnishes about twenty quills in the year. The quills are the large feathers taken from the ends of the wings. In their natural state, they are covered with a membranous skin, and have a toughness and softness which prevents their being easily split. They are also opaque, and the vascular membrane on the interior of the barrel adheres to it so strongly, that it is with difficulty detached. To remedy these defects, and to fit the quills for their destined purpose, is the business of the quill-dresser. He takes a large bundle of the quills, just as they are taken from the bird, and proceeds to separate them into three parcels,—differing from each other in the size and quality of the quills. The value is estimated both by the length and the thickness of the barrel; those having the largest and longest barrels being called "primes," which fetch the highest price in the market; the next best in quality are designated as "seconds," and the third, or smallest size, are called "pinions." The process of sorting being completed, the workmen proceed to "clarify" the quills, the principal object of which is to remove the membranous skin. The quills are plunged for a short time into heated sand: the heat of the sand makes the outer skin crack and peel off, which is further aided by scraping them with a sharp instrument; while, at the same time, the internal membrane becomes shrivelled up, and falls down to the point of the quill. The barrel of the quill is also hardened and rendered transparent by this process, in consequence of the heat consuming or drying up the oily matter resident in it. This latter effect is increased by repeated heatings: and when done for the purpose of hardening the quill, is called *dutching*, probably from the circumstance that the process was first adopted in Holland. (The term Dutch pens, is frequently applied to quills that have been passed through hot ashes, to remove the grosser fat and moisture, and to render them more transparent.) For the best pens, the process of dutching is repeated several times; but care is necessary, in order that the heating should not be carried so far as to injure the barrel. The quills, after this process, are either of the colour of fine thin horn, or of an impure white; but before they are brought to market they undergo another process, with the two-fold object of giving them an uniform yellow colour, and to make them split more easily. They are dipped into diluted aquafortis or nitric acid, which has the effect desired. It is however thought by some, that this process, although it improves their beauty, injures their quality by making them too brittle, so that the slit is apt to run up on pressing with moderate firmness; for this reason, many persons who write much, such as clerks in mercantile houses, &c., frequently prefer a quill which has not undergone this process, as being more durable. The quills having been thus dressed and finished, a portion of the barb is stripped off, to occupy less room in packing and the quills are tied up into bundles of twenty-five or fifty each, for the market.

The process of preparing the quills is, however, subject to some variation. Some dressers adopt the following mode. The quills are first moistened, not by immersion, but by dipping their extremities into water, and allowing the remaining parts to absorb moisture by capillary attraction. They are then heated in the fire or in a charcoal chaffer, and are passed quickly under an instrument with a fine edge, which flattens them in such a manner as to render them apparently useless. They are then scraped and again exposed to heat, whereby they assume their original form. This is a remarkable fact, and may be illustrated by taking a feather and crushing it with the hand so as to destroy it to all appearance; if we now expose it to the action of steam or a similar temperature, it will speedily assume its former condition.

Many of the quills after this preparation are cut into pens by means of the pen-cutters's knife, and are also trimmed. A pen-cutter will cut in a day two-thirds of a long thousand, consisting of 1200 according to the stationer's computation. A house in Shoe-Lane, London, cuts generally about 6,000,000 of pens yearly; and during the year 1834, notwithstanding the introduction of steel pens, it cut many more than it had done in any previous year. It is calculated by pen-makers, not more than one pen in ten is ever mended.

Swan quills, which are very large in the barrel, are sometimes employed for pens, and though expensive at first, are perhaps, not dearer ultimately than the smaller quills, their length and capacity of barrel compensating for the larger charge. Crow-quills are generally employed in drawing and designing, on account of the fine point to which they can be brought. They are particularly useful in that kind of etching which is intended to imitate prints. Quills may be hardened by steeping them in alum-water, at a boiling temperature, for a few minutes.

There is a modern contrivance by which six or eight pens may be made out of one large quill. The narrow end, and also the stalk of the pen being cut off, leaving the barrel only remaining, the latter has a cylinder inserted through it, a little smaller than its own diameter. It is then placed in a machine in such a way that two cutting edges pass along the barrel, one on each side, by which the quill is cut longitudinally into two semi cylindrical halves. These pieces are then placed in a groove with the convex side undermost, and the edges are made straight and smooth by having a plane run along them. These half-cylinders of quill are then cut into three or four pieces, according to their length, and each piece is operated on by the nibbing-machine, which is a sort of cutting press. A few strokes with a pen-knife then brings each little piece to the form of a pen, which, fixed in a handle, is fit for use.

The first attempt at the construction of permanent pens, appears to have consisted in arming the nibs of Turkey-quill pens with metallic points or nibs. As the friction of the quill pen upon the paper, and the softening produced by the ink, are the causes which wear away the nibs of ordinary pens, it is obvious that metal is better calculated to withstand these two influences than quill. But although the metallic nibs greatly increased the durability of the pen, it was at the expense of the elasticity of the quill; and since the durability of the metallic-nibbed pen was not adequate to its additional cost over the common quill pen, this method was soon abandoned.

Pens have been made, from time to time, out of horn and tortoise and other shells. These pens were of course more expensive than common quills, and nearly all of them more durable. Nibs have even been formed, somewhat successfully, of precious stones, the advantage of which is, that they are subject to no wear and corrosion. In 1823 Messrs Hawkins and Mordan employed horn and tortoise-shell, which were cut into nibs, and softened in boiling water; small pieces of diamond, ruby, and other precious stones were then embedded into them by pressure. In this way were insured durability and great elasticity. In order to give stability to the nib, thin pieces of gold, or other metal, were affixed to the tortoise-shell. Pens somewhat similar were formed by Mr Doughty; his nibs were rubies set in fine gold. With these pens a person could write as finely as with a crow-quill, or as firmly as with a swan-quill, or the two modes might be combined. These pens possessed considerable elasticity, and by their means an uniform manuscript, unattainable by means of ordinary pens, could be produced. Pens of this construction have been in constant use for upwards of six years, and at the end of that time exhibited no signs of wear, they were as perfect then as ever. In using them, however, care is necessary to preserve the nibs from contact with hard bodies; they require occasional washing with a brush in soap and water. Mr Doughty states that, although they are costly at first, yet, in the end, they will be found economic, on account of their permanency. To prevent injury to the points, in the act of dipping this pen into an ink-stand, Mr Doughty lines the interior of his elegant ink-stands with India-rubber, or places a bottle of that material within the stand, to contain the ink.

Dr Wollaston also constructed pens from two flat slips of gold, placed angularly side by side, and which were tipped with the metal rhodium; others have employed the metal iridium; but these pens have been abandoned on account of their expense, and the great care necessary to their preservation. These pens were, however, very durable, though not equal to the ruby nibs.

Many of the pens to which we have alluded, were sadly deficient in that indispensable quality, elasticity. To supply a remedy to this defect, it was proposed to place springs on the backs of such pens, sliding backwards and forwards to vary the elasticity according to the different hands required in writing. This plan was somewhat successful, but a great objection was, that the ink drying upon the pen, in a great measure neutralized the action of the spring.

Metallic pens appear to have been introduced into various seminaries, from time to time as rarities, among writing materials; they were given as prizes, rewards for merit, &c. But the first mention that we find of *steel pens* for writing, is in 1803, when Mr Wise constructed barrel-pens of steel, mounted in a bone case for convenience of carrying in the pocket. These pens were very dear, and produced to their inventor but a scanty income. For many years, however, Wise's pens were the only steel pens that could be had, and by means of great activity in "pushing a sale" of them, they were to be had at almost every stationer's shop in the kingdom.

About 1826, the celebrated Perryan pens first appeared. Mr Perry may be regarded in the light of a great improver; many of his pens are ingenious and original in construction. He arranges his pens into genera and species, advertises their beauties and their merits in prose and rhyme, and has thus, not altogether undeservedly, acquired fame and renown, and, we doubt not, profit, to which, years ago, a mere pen-maker would not have aspired. Mr Perry first overcame the rigidity complained of in steel pens generally, by introducing apertures between the shoulders and the point of the pen; thus transferring the elasticity of the pen to a position below instead of above the shoulder. This was the object of his patent of 1830. In 1832 further improvements suggested to him the propriety of seeking a second patent, which he obtained for a pen now bearing the odd cognomen of "The Double Patent Perryan Pen." Perry's "Regulating Spring Pen" is furnished with a sliding spring, which increases or diminishes its flexibility, according as it is placed farther from or nearer to the point. In another case, Mr Perry employs a thread of India-rubber round the nibs of his pens, the yielding of which allows the points to open in proportion to the pressure.

One of the most extensive manufacturers of steel pens is Mr Joseph Gillott, of Birmingham. This gentleman employs three hundred pairs of hands, and consumes fifty tons of steel annually. Now one ton of steel is sufficient to make about two millions of pens; hence this manufacturer alone furnishes about one hundred millions of pens annually.

The kind of pen made by Mr Gillott is similar to the original pen by Wise. The improvement of the modern maker consists in employing metal of a better quality, and in a thinner and more elastic state; in making the slit shorter, and in carefully attending to the finish and temper of the metal. These improvements have been attended with such a reduction in price, that a gross is now sold for very little more than was formerly charged for one of Wise's pens.

The common "Three slit Pen" has long been, and still is, a favourite with steel pen writers. Its peculiarity consists in having a slit on each side of the central slit, the elasticity being thereby much increased.

The nibs of all pens increase in breadth by use, so that steel, as well as quill pens, require mending, or rejecting for a new one. The difference is a question of time, for while a quill pen will increase in breadth in an hour, the steel pen may be used for many days without the necessity of mending or rejection. But steel pens may be mended by means of a fine file or an oil stone, by which the nibs can be brought to points sufficiently acute for the purposes of the writer; but the present low price of steel pens renders it very questionable, whether the time employed in mending them would not be thrown away.

Mr Gillott has taken out a patent for an improved pen, the object of which is to remedy the defect complained of, that the nibs increase in breadth by use. In the new pen, the nibs are made parallel-sided for about one-eighth of an inch long, the remaining portion being cut in the usual curved manner, so that one-eighth of an inch may be worn away without increasing the breadth of the nibs. We have not used any of these pens, but it occurs to us, that by the above means the equable opening and closing of the nib during writing cannot be insured, that the ink would not flow down in sufficient quantity, and that unless the pen were held in one particular direction, the equal wearing away of the nibs would not occur. We should rather fear that the pen would often act the part of a chisel, and dig into the paper instead of moving over its surface; but these objections are offered without ever having used the pen which suggests them.

The oblique position in which the pen is held induced Messrs Mordan and Brockeden, in 1831, to make their *oblique* pens, in order that the two sides of the nib should bear equally on the paper. The form of this pen is that of a bird's head and bill; the slit, or mouth of the bird, is the part employed in writing, and this slit is inclined, at an angle of 35°, to the general direction of the pen. They hold a great deal of ink, and their use is pleasant to the writer.

Other pens, called *Lunar* Pens, have been adopted. Their under surface being large and concave, a great portion of ink is taken up by them, and thus the writer's time is economized.

Mr Gowland has invented a pen with an additional nib, called the "Three-nibbed Slit Pen." The additional nib is formed by cutting it out of the shank, and turning it back over the nibs. This pen is manufactured by Mordan, as also "Mordan's Counter-oblique Pen." Both these pens hold much ink, and the awkward appearance of obliquity in the bird's-head pen is removed, while, at the same time, the oblique effects are preserved.

There are many other forms of steel pens, which we need not stop to describe, since the examples already given will afford to the reader a sufficiently accurate idea of their forms and uses. We proceed, therefore, to perhaps the most interesting portion of this article, viz., the processes by which steel pens are manufactured.

The steel with which the pens are made is rolled into very thin plates; it is then cut into slips, about four inches broad and three feet long, then annealed for fourteen hours, and again submitted to the roller; the thickness of these bands is not more than $\frac{1}{100}$ of an inch. The bands are then passed under a stamping-press, and pieces of the proper size for the pens are cut out with great rapidity. These pieces are called *blanks*, or *flats*, and are so cut out, that the fibres of the steel shall run in the direction of the length of the pen. The blanks are now submitted to the action of a hardened steel punch and matrix, of the exact size and shape of the pen, and which are attached to a powerful fly-press. The pens are then softened by being put into an iron box containing tallow; this box is placed in a furnace and equally heated. When the box is withdrawn, the pens are emptied upon hot ashes and covered with the same, and so allowed to cool gradually; by this means they are sufficiently soft for the subsequent processes. They are then marked for the slits; this is done by means of an extremely fine-edged chisel, brought down separately upon each pen, and so admirably adjusted that two-thirds only of the substance of the pen is cut through. The edge of this chisel is finer than any razor, but much harder, because it will perform its office for a whole day without renewing its edge; this superior quality is given to the steel by hammering it for several hours. This is an important fact, and seems to have been discovered by the pen-makers. When the other slits and openings have been made, and the maker's name stamped, the next operation is called *dishing*, by which the proper shape is given to the pens by means of a metallic punch and die, accurately fitting each other, the two being the exact form of the pen.

The pens are now hardened by being heated to redness, and being then plunged into cold oil, which must be at least three feet deep. The oil in a few weeks loses its properties and becomes charred. The next operation is cleaning and polishing; this is effected by a very curious machine. It consists of a tin cylinder, eight or nine inches in diameter, and three feet long, with a hole in the middle of its length, for putting in and taking out the pens, which hole is covered by a lid. This cylinder is hung on joints at each end to cranks, formed one on each of two axles furnished with a fly-wheel, and one of them with a handle. As this latter is turned, the cylinder is thrown up and down and backwards and forwards, and the pens are agitated in a manner similar to materials shaken in a bag. This motion is continued for eight hours, when many thousands of pens, by rubbing against each other, are found to be entirely deprived of any roughness which might have otherwise existed on them, and which, though invisible to the eye, might offer serious impediments to free writing. They are now tempered by being placed on a furnace-plate, and as soon as they have acquired a bright blue colour they are removed; this colour indicates the best temper for the pens, and is due to a thin film of oxide formed on the surface; were they heated in vacuo, or in any medium containing no oxygen, the blue colour would not appear. The last operation consists in cracking the slits, which is done by pressing the nibs suddenly with a pair of pincers; the slit, which was cut only two-thirds through, then suddenly opens.

It is calculated that the total quantity of steel employed in this manufacture, amounts to 120 tons per annum, from which upwards of 200,000,000 of pens are produced.

There is, however, a considerable waste of material in this branch of art. The pieces of steel cut out of the pens cannot be applied to any use; it is so thin that it cannot be welded, and it cannot be melted, because it takes fire and burns, in consequence of access of air between the thin pieces.

Pen-knives. — The extraordinary demand for steel pens within the last few years, in which the aid of a pen-knife is not called for, would have induced us to think that the use of quill pens must have greatly diminished, and that pen-knives must likewise have become much less in request. But such does not appear to be the case.

Sheffield is the great workshop which supplies almost all the world with knives. The hammering of the steel bar which is to form the blade, is carried on in the *smithy*. A boy is employed to keep several bars of steel heated, or being heated at one time; and he hands them to the striker or hammerman, one at a time, so that he is kept constantly at work. A pen-knife-blade is formed by two heatings. In the first place, that part which we call the blade is fashioned by hammering, and then chopped off the end of the rod. It is then again heated in the forge, taken up by a pair of tongs, and the part which is called the *tang* is formed; this tang is the part by which the workman holds it while grinding the blade, and which is ultimately inserted in the handle. The whole is then smithed, or smartly hammered after it has ceased to be soft, in order to close the pores, and produce the greatest possible degree of density. The nail-mark—used when "opening" the pen-knife—and the maker's name, &c., having been struck upon it, it is ready for hardening. The steel springs for the back, and the iron casings for the inner sides of the handle, are made by workmen ranking a degree lower than the blade makers.

When the blade is properly hammered, it is next hardened and tempered,—processes which, though extremely simple in themselves, require the nicest tact and judgment, as upon them the excellence of the future knife greatly depends. Steel is commonly hardened by being plunged, while red-hot, into cold water, and afterwards tempered by being heated until the surface assumes a particular tinge, varying from a light straw colour to a deep blue, according to the nature of the instrument which is being made.

After the blade has been hardened, it is, in most cases, carried directly to the grinding mill, or wheel, for the purpose of being ground. Before the extensive introduction of steam power, the grinding wheels were turned by water; but now steam has usurped the place of water, in this as in many other instances. The grinding stones revolve on horizontal axes, and are of various sizes for different kinds of work. The blade is frequently wetted, and applied to the stone in a way which may be easily conceived. The pen-knife when ground, is worked on a trundle or *glazier*, which is a wooden wheel about four feet in diameter and two inches thick. On the edge of this wheel is a coating of soft metal, consisting of lead and tin, about an inch in thickness; and on this, powdered emery is applied.

The next process is that of *polishing* or *buffing*, the blade, which is done on a wheel similar to that last described, except that the surface of the wheel is covered with buff leather instead of emery. On this leather some very fine polishing powder is applied, and the blade polished.

The blade now passes into the hands of the workman who is to finish it and finally place it in its handle. The workman wears a breast-plate in front of his body, fastened round him with straps: the breast-plate contains a piece of steel with several small indentations. These are to receive the blunt end of a borer which is to make small holes for rivets, and for the hole for the pin upon which the blade works at the joint. An ingenious instrument called the *boring-stick*, gives a rapid rotatory motion to the borer, which is a sharp instrument, and thus enables it to penetrate the metal, applied against the sharp end of the borer.

The materials employed for handles are almost innumerable. Gold, silver, ivory, mother of pearl, tortoise-shell, horn, bone, cast-iron, &c., are employed, according to the costliness of the article. The forms of handles are almost as various as their materials, as is well known.

When the blade and the handle, with its metallic lining, spring, &c., are properly made and the holes bored, the whole is pinned together, (loosely at first, till, all the parts being exactly fitted, the knife is found to work properly,) with pieces of wire, and rivetted with the hammer. The sides of the handle, if of horn, ivory, or shell, are then filed and scraped, and then polished on a wheel covered with buff leather. A small shield, either of silver or some other metal, is frequently inserted in one side of the handle. The groove or depression which is to receive this shield is made in a manner somewhat resembling that in which the holes are bored.

PENZANCE; a sea-port town in Cornwall, in the parish of Madron, and hundred of Penwith, situated on the north-western shore of Mount's Bay, ten miles from the Land's End, and 280 S.W. from London. It is the port for all Mount's Bay, and the market-town for a large surrounding district. The amount of tonnage which entered the port of Penzance and its outports during 1837 was 49,943, of which 5179 tons were in the foreign, and 44,764 in the coasting trade. The amount which sailed outward in the same year was 17,441, of which 386 tons were in the foreign, and 17,055 in the coasting trade. The amount of duties in that year was £16,839. Penzance is distinguished for the mildness of its climate, and its early garden produce. It supplies large quantities of vegetables, fish, pork, butter and poultry to distant markets. By the municipal reform act of 1835, the town annually elects the corporation, consisting of a mayor, six aldermen, and eighteen councillors. Population in 1841, 6578; including parish of Madron, 11,144. A very full and elaborate statistical account of the parish of Madron and borough of Penzance, digested from information furnished the Statistical Society of London, by Richard Edmonds, Esq. jun. of Penzance, will be found in the second volume of the Journal of the Statistical Society of London, part iv. July, 1839.

PETERBOROUGH; an ancient but small city in the county of Northampton, seventy-nine miles from London. It has a well supplied market on Saturday. The houses are mostly the property of the earl Fitzwilliam. Population in 1841, 6107.

Peterborough derives its name from an abbey founded here during the Heptarchy, and dedicated to St Peter. The present edifice, now the cathedral of Peterborough, was begun in the year 1117, and finished to a certain extent in 1143. In 1200, the abbey being in a state of poverty, king John appointed Acharius, prior of St Albans', as abbot, by whose care it began to flourish, and in 1238 it contained one hundred and ten monks. It is supposed, that soon after this, the beautiful *west front* of the Cathedral was erected. By the west front must be understood, the two square towers, with lofty pinnacles, at the north-west and south-west corners; the three noble gothic arches which stand between these towers; and the portico between the arches and the west wall of the church. Within each of the two towers is a winding staircase, leading up to the roof of the portico. That portion of the cathedral, called the *new building*, which is at the east end, is considered the most modern portion of the whole, the date of it being about A.D. 1500.

The dimensions of the principal parts of the building are as follows:

	Feet.
Length of the whole Cathedral, measured on the outside,	479
Length of the Transept from north to south, . .	203
Breadth of the west front, ...	156
Height of the Lantern, ...	150
Height of each Gothic arch at the west front, . .	82

In 1534, Chambers, the then abbot, together with the prior and thirty-seven monks, professed, under their hands and seals, fidelity and obedience to king Henry VIII. and acknowledged him to be supreme head of the church of England. Peterborough then became a bishopric, and its abbey a cathedral. In the following year, Catharine, the first wife of Henry VIII., died at Kimbolton Castle, Huntingdonshire, and was buried on the north side of the choir, nearly opposite to the bishop's throne. In the same cathedral, in July 1587, by torchlight, the remains of the unhappy Mary, Queen of Scots, were consigned to a tomb on the south side of the choir. Fotheringay castle, where she was executed in the February preceding, is about ten miles from Peterborough. After the body had remained in its tomb for about twenty-five years, her son, James I., removed it to Westminster Abbey; but the superb monument raised to her memory continued entire.

The income of the bishopric of Peterborough is comparatively small, being, according to the parliamentary return made by the bishop, only £3518. By a recent law, it is to be augmented from part of the revenue of the see of Ely, and the archdeaconry of Leicester is placed under the episcopal jurisdiction of Peterborough.

PETERHEAD; a burgh and sea-port of Scotland, in the district of Buchan, and county of Aberdeen, situated upon the most easterly point of the mainland of Scotland, thirty-two miles N. by E. of Aberdeen, and 145 N. E. of Edinburgh. It was erected into a burgh of barony in 1593 by George, earl Marischall, and the superiority of the town belonged to the Marischall family till forfeited in 1715. In 1728, the governors of the Merchant-Maiden Hospital of Edinburgh acquired the greater part of Peterhead by purchase, and, as superiors, they had the nomination of the magistrates, until the passing of the burgh reform bill in 1832, when the municipal government was vested in twelve councillors, who from their own number choose a provost, three bailies, and a treasurer. The weekly market day of the town is Friday; and there are two annual fairs. The town is built in the form of a cross, and is divided into four districts, which are united to each other by a continuation of streets; these districts are respectively called the Kirktoun, Ronheads, Keith Inch, and Peterhead proper. The houses, which are built of granite, so abundant in various parts of the county of Aberdeen, are neat and comfortable, and many of them commodious and elegant. The streets of recent erection are well laid out. The harbours of Peterhead are safe and commodious, and accessible both from the south and north, being about equally distant from the Firths of Forth and Moray. To vessels frequenting the east coast of Scotland, as well as to the regular traders of the port, they afford excellent protection. At the extremity of the south bay a light-house is erected. The shipping belonging to the port amounts to about 13,000 tons, and about 250 vessels annually seek shelter in the harbour. The exports chiefly consist of agricultural produce and the produce of the fisheries; also of granite from the neighbouring quarries. The imports are groceries, flour, iron, timber, coal, lime, &c. Peterhead has been long engaged in the whale and herring fisheries. It lately owned twelve vessels in the whale trade alone, with 3629 tons. In 1837, 262 boats were employed in the herring fishery, and upwards of 40,000 barrels of herring were caught. The district of Buchan, of which Peterhead may be denominated the capital, forms an excellent resort for those who require the bracing effects of sea bathing and sea air, and in its vicinity are certain chalybeate waters long esteemed in cases of general debility and nervous affections. Population of town and parish of Peterhead in 1841, 7619. See a curious History of Peterhead, composed, printed, and published by the author, Peter Buchan.

PICKEN, Andrew, the author of the "Dominie's Legacy," was born at Paisley in the year 1788. His father was an eminent manufacturer in that town, and educated him for the mercantile profession. At an early age he visited the West Indies; but finding that the business in which he was engaged afforded no very bright prospects, he returned to Europe, and obtained a confidential situation in the bank of Ireland. To the great regret of his Irish friends, he subsequently removed to Glasgow, and entered into business. Here he first came before the world as an author, by publishing "Tales and Sketches of the West of Scotland," a work which had great local success. In this volume, appeared for the first time, the pathetic story of "Mary Ogilvie," which showed no common power of combining the ordinary incidents of life, into pictures of intense and harrowing interest. Soon after this publication, circumstances induced the author to quit Glasgow; and he removed to Liverpool, where he established himself as a bookseller. The mania of speculation, which in 1826 seized even on those who were deemed paragons of worldly wisdom, found too ready a victim in Picken, to whom the world of business was as a sealed volume; he joined in some of the wild projects of the time, and lost his all. But like Francis I., he might have boasted that honour still remained; when his books were inspected, the creditors with one voice, bore honourable testimony to his integrity, and expressed their sorrow for his misfortunes. They would readily have aided him in commencing business anew, but literature had now marked him for her own, and he came to London with the manuscript of a novel; the composition of which had been the amusement of his leisure hours, and subsequently his chief consolation in difficulty and distress.

"The Sectarian," as this novel was called, excited considerable interest at the time of its first appearance; it showed great skill in what may be termed the morbid anatomy of the mind, and one picture, of madness caused by religious melancholy, which was drawn from nature, gave considerable offence to persons who are too apt to confound an attack upon fanaticism with hostility to religion. This error, and in the present instance, no greater error could be made, prevented "The Sectarian" from obtaining the success which its merits deserved. But though the circulation of "The Sectarian" was limited, it had the effect of making the author known to the editors of the principal periodicals, and from this time, Mr Picken became a regular contributor to the leading Magazines and Reviews. The publication of "The Dominie's Legacy," in 1830, finally established his fame as the historian of Scottish humble life; we say the historian rather than the delineator, because the Dominie speaks not of what he has imagined, but of what he has seen, felt, and understood, almost from his infancy; and we remember his characters, more as those of persons that we somewhere knew, than of personages we have seen described. The work had great success, and its fame has not been injured by time.

Mr Picken's next publication was "The Club Book," to which several of the most popular living writers contributed. The tales written by the editor, were in his happiest style; that, entitled, "The Three Kearneys," was founded on circumstances which he had witnessed during his residence in Ireland, and it showed that Mr Picken had thoroughly investigated the mixed character of the Irish peasantry. "The Deer-Stalkers" was also a tale of great interest; it was dramatized at the Queen's Theatre, and much admired. Soon after appeared a work on the Canadas, professedly a compilation; in preparing this volume, Mr Picken received valuable assistance from his friend Mr Galt. This was followed by "Waltham," a tale published in Leitch Ritchie's "Library of Romance," and though not very favourably received, displaying, perhaps, higher powers of thought and sentiment than any of his other works.

In the course of 1833, he published "Traditionary Stories of Old Families," in two volumes; designed as the first part of a series, which would embrace the legendary history of Scotland, England, and Ireland. The project excited considerable interest, and many of the most distinguished members of the aristocracy offered to aid the author, by giving him access to their family papers. Before he could avail himself of the ample stores thus opened to him, he was attacked by the disease which so rapidly terminated his life. On the 10th of November, 1831, while conversing with his son, he was suddenly struck down by apoplexy, which terminated in death, on the 23d of the same month.

A little before his last illness, he had completed a novel, which he regarded as by far the best of his productions. It was published after his death, and is entitled, "The Black Watch," which was the original name of the gallant 42nd regiment. The date of the story is about the time of the battle of Fontenoy.

The character of Picken, like that of the Dominie of his own tales, was simple, affectionate, retiring; dwelling apart from the world, and blending in all his views of it the gentle and tender feelings reflected from his own mind.

PILGRIMAGES. The custom of making pilgrimages to spots of reputed sanctity prevailed to a great extent in the latter ages of paganism, and coupled with a reverence for relics was transferred at a very early period to the Christian church. Journeys of this kind to Jerusalem are mentioned in the third century; and in the fourth they are said, by St Jerome, to have become common from all parts of the Roman empire. The custom of worshipping the relics of martyrs also prevailed in Egypt in the same century, as we learn from Eunapius, who angrily complains that the Christians of Canopus had transferred the homage formerly paid to the Egyptian deities to nauseous collections of bones and relics. It was much later, however, before either practice became established in its full extent, probably not till the time of the crusades. In England there were few shrines or relics of great repute which dated beyond this period. In some of the most celebrated, as that of the Virgin at Walsingham, and the true blood at Hailes, the sacred *matériel* was confessedly imported by the crusaders; while the greatest of all, the shrine of Becket at Canterbury, derived its existence from an event as late as the twelfth century.

The passion of visiting shrines and other sacred places, appears, in the middle ages, to have prevailed pre-eminently in England. In the days of Bede, a pilgrimage to Rome was held to be a "great virtue;" and the number of our countrymen who visited the papal court is said to have excited the sarcastic jokes of the Italians on our catholic enthusiasm. In later ages, the "shadow" of St James at Compostella was chiefly visited by English pilgrims, and appears to have been set up to divert a part of the inundation which flowed upon Rome. In the number of her domestic shrines England also exceeded all other countries. Thirty-eight existed in Norfolk alone, and to one of these, that of our Lady of Walsingham, Erasmus says, every Englishman, not regarded irreligious, invariably paid his homage. The pilgrims who arrived at Canterbury, on the sixth jubilee of the translation of Becket, are said to have exceeded 100,000; a number which, if correctly given, must have comprised nearly a twentieth of the entire population of the kingdom. Even on the eve of the Reformation, when pilgrimage had much declined, it appears, from the report of one of Henry's visitors, that upwards of 500 devotees, bringing money or cattle, had arrived the day before he wrote, at an obscure shrine in Wales. These facts give some idea of the extent to which pilgrimages were carried in this country, and impart a peculiar interest to the subject.

The pilgrimages of the middle ages may be divided into four classes—first, pilgrimages of penance or devotion to foreign shrines; secondly, pilgrimages of the same kind to English shrines; thirdly, pilgrimages to medical and charmed shrines; and fourthly, vicarious pilgrimages for the good of the soul of the principal. Other kinds have been enumerated, but these contain all which had any professed reference to devotion.

The practice of making foreign pilgrimages existed in England from the seventh to about the middle of the fifteen century. Few persons of any station or wealth failed during that period to engage in these religious tours, and in later ages they were not uncommon among persons in the middle ranks of life. The Wife of Bath, for example, though but a simple cloth-worker, had been as a pilgrim to Rome, Compostella, and Jerusalem; but the expense of such journeys, and the long absence which they required, must generally have confined them to the affluent: although, in that spirit of restlessness which pervaded the middle ages, persons of the lowest rank sometimes engaged in them, and trusted to chance for support.

The professional costume of a pilgrim is usually described as consisting of a long coarse russet gown with large sleeves, and sometimes patched with crosses; a leather belt worn round the shoulders or loins, a bowl and bag suspended from it; a round hat, turned up in front, and stuck with scallop shells, or small leaden images of saints; a rosary of large beads hanging from the neck or arm, and a long walking staff (the bourdon), hooked like a crosier, or furnished near the top with two hollow balls, which were occasionally used as a musical instrument.

Before setting out, the pilgrim received consecration, which was extended also to the several articles of his attire. On a certain day he repaired to the church, and, after making confession, he prostrated himself before the altar, where certain prayers and masses were said over him, ending with the *Gloria Patri*, *Ad te Domine levavi*, and the *Miserere*. He then arose, and the priest consecrated his scrip and staff, sprinkling each with holy water, and placing the former round his neck, and the latter in his hands. If he were going to Jerusalem, the crosses of his gown were sprinkled in the same way, and publicly sewed upon his garment. The service then ended with the mass, *De iter agentibus;* and, on the day of taking his departure, he was sometimes led out of the parish in procession, with the cross and holy water borne before him. Before commencing his journey, he also settled his worldly affairs, and frequently gave a part of his goods to religious uses. In Blomefield's Norfolk, an instance is cited of a pilgrim who insured the prayers of a religious house during his absence, by a gift of cattle and corn, and gave the reversion of his estates to it, if he should not return. Such acts of generosity had probably a reference to the protection which the church bestowed on these devotees. During their absence their property was secured from injury, nor could they be arrested or cast in any civil process. The most desperate characters respected the sanctity of their profession, and in some instances have been known, after robbing them by the way, to restore all they had taken from them. The pilgrims to foreign places were compelled, by a law of the 9th of Edward III., to embark and return by Dover, "in relief and comfort of the said town;" and, in the 13th Richard II. 1389, at the request of the "barons of Dover," who alluded to this ordinance, the king commanded, that all pilgrims and others, excepting soldiers and merchants, should embark at Plymouth or Dover, and no where else, without special license from the king himself: those, however, who wished to go to Ireland might embark where they pleased. From the reason assigned by the barons for their petition, that "la serche meultz purra estre fait en un port q'en plusours," it may be inferred, that the restriction arose from a desire to check the smuggling, which is said to have been extensively carried on by persons in this disguise.

In the order of foreign pilgrims must be reckoned the palmers; a class of men whose real history and condition is little known, though their name is familiar. According to the most probable account, their designation was derived from the palm (the symbol of Palestine,) branches of which were often brought home by them, as evidences of their journey. The distinction between them and ordinary pilgrims has been defined as consisting in the following circumstances: "The pilgrim had some home or dwelling-place; but the palmer had none. The pilgrim travelled to some certain designed place; but the palmer to all. The pilgrim went at his own charges; but the palmer professed wilful poverty, and went upon alms. The pilgrim might give over his profession, and return home; but the palmer must be consistent till he had obtained his palm by death." These distinctions, however, were not invariably preserved; and it would be perhaps difficult to determine any that were so. The profession of a palmer was at first voluntary, and arose in that rivalry of fanaticism which existed in the earlier part of the middle ages. But afterwards, in the tenth and eleventh centuries, it was not unfrequently imposed as a penance, and by a law of Henry I., priests who revealed the confessional were punished by these perpetual pilgrimages. In some cases, a variety of severe conditions were added to the sentence. Some who were thus condemned were made to wander about almost naked, carrying rings and chains of iron; and others were bound, in all their journeys, to kneel down at short intervals, and beat the earth with the palms of their hands. There can be no doubt that these forms of penance were actually inflicted; but to what extent, in any particular age, it is impossible to ascertain.

The rise of the domestic shrines of England, and the decline of foreign pilgrimage, are evidences of the milder character which asceticism had begun to wear. The spirit and manner of these pilgrimages differed in many respects from those of the former kind. From their diminished distance and danger, and their greater frequency, they had comparatively little of the same solemn preparation or devotional austerity. Few domestic pilgrims, probably, underwent the ceremony of consecration, or travelled in any peculiar costume This is evident from Chaucer's pilgrims, who are all equipped in their gayest dresses, and exhibit no distinctive sign of their profession in appearance or spirit. They pursue their journey gaily on horseback, and make it an occasion of mirth and enjoyment rather than of religious mortification.

"Every man in his wise made hertly chere,
Telling his fellow of sportis and of cheer,
And of mirthes that fallen by the waye,
As custom is of pilgrimes, and hath been many a daye."

It may be inferred from a petition of the Commons to the king in 1435, that pilgrimages were made by persons in their best apparel. They state, that one John Carpenter, a husbandman of Brydham, in Sussex, "saying to Isabella, his wyff, that was of the age of xvi yere, and had be married to hym but xv dayes, that they wold goo togedre on pilgremage, and made to araye hir in hir best arraie, and take hir with him fro the said toune of Budham to the town of Stoghton, in the said shire, and there murdered horribly his wyff."

These remarks, however, are chiefly true of the customary and periodical pilgrimages. In those which were undertaken spontaneously, from some strong emotion, a severer character prevailed. Mr Fosbrooke contends, that, in pilgrimages of this kind, it was an essential condition, that the pilgrim should walk his journey barefoot; and there are instances to the last of persons of the highest rank adopting this painful mode of travelling. In one of the pilgrimages of Henry VIII. to Walsingham, he is said by Spelman to have walked thither barefoot from Barsham, a distance of about three miles; and in the same way, the beautiful Henrietta Maria, queen of Charles I., was once sentenced by her confessor to make a pilgrimage from Somerset House to Tyburn, and there to do homage to the saintship of some recently executed catholics. "No longer agon then upon St James his day last past," says Mr Pory, in a letter to Mr Mead, dated 5th July, 1626, "those hypocritical dogges made the pore queen to walke a foot, some add barefoot, from her house at St James to the gallows at Tyborne, therby to honor the saint of the day in visiting that holy place, where so many martyrs, forsooth, had shed their blod in defence of the Catholique cause. Had they not also made her to dabble in the durte of a foul morning from Somerset House to St James, her Luciferian confessour riding allong by her in his coach! Yea they have made her to go barefoot, to spin, to eat her meat out of tryne dishes, to waite at the table and serve her servants, with many other ridiculous and absurd penances."

In all pilgrimages of real devotion, the practice of at least walking was common. In one of the Paston Letters, written in 1471, the duke and duchess of Norfolk are mentioned as making a pilgrimage together in this way from Framlingham to Walsingham; and it must have been adopted from necessity in the cases in which entire families made pilgrimages with all the children and servants. Some of the above instances, however, may be said equally to prove the greater severity, or at least decorum, which marked these religious excursions in the upper ranks, and which prevailed at all times, to a degree that would probably not be inferred from Chaucer's picture.

In the pilgrimages of the lower orders, however, his descriptions seem to have been fully justified. A passage quoted by Mr Fosbrooke, from one of the early state trials, gives us a picturesque idea of the gay and social spirit in which they were conducted. The dialogue occurs between a captious disciple of Wickliffe, in the time of Henry IV., and Arundel, archbishop of Canterbury. "Also, sir," he says, "I knowe well, that when diverse men and women will go after their owne wills, and finding out a pilgrimage, they will order to have with them both men and women that can sing wanton songs; and some other pilgrims will have with them bag-pipers, so that every towne they come through, what with the noise of their singing and with the sound of their piping, and with the jangling of their Canterbury bells, and with the barking out of dogs after them, that they make more noise than if the king came that waye, with all his clarions and minstrels. And if these men and women be a month in their pilgrimage, many of them shall be half a year after great janglers, tale-tellers, and liars."

To this the archbishop quaintly replies, that "Pilgrims have with them singers and also pipers, that when one of them that goeth bare-foote striketh his toe upon a stone, and maketh it to bleed, it is well done that he or his fellow begin then a song, or else take out of his bosome a bagpipe, to drive away with such mirthe the hurte of his fellowe. For with such solace the travaile and wearinesse of pilgrims is lightly and merrily brought forthe."

The object of a pilgrimage was sometimes of a general and sometimes of a particular kind; and the ceremonial which took place on arriving at a shrine differed accordingly. At Boxley and Hailes the pilgrim underwent a sort of ordeal, which was supposed to determine his spiritual state. At the former place he lifted a small wooden image of St Rumbold, which was artfully pinned to the altar if his offering had been insufficient; and at the latter was shown a phial of the true blood, with a blackened side, which when turned towards him rendered the contents invisible. But these were particular cases; and, generally speaking, a visit to a shrine included nothing more than the ordinary gratification of curiosity or devotion. A tolerable idea of its general nature may be gained from the description given by Erasmus of his visit to Walsingham. His dialogue on this subject is perhaps too fanciful in parts to be implicitly adopted; but there is no reason to doubt the general correctness of its details, the minuteness of which gives it an additional value.

The pilgrims who arrived at Walsingham entered the sacred precinct by a low narrow wicket. It was purposely made difficult to pass, as a precaution against the robberies which were frequently committed at the shrine. On the gate in which the wicket opened was nailed a copper image of a knight on horseback, whose miraculous preservation on the spot by the Virgin formed the subject of one of the numerous legendary stories with which the place abounded. To the east of the gate, within, stood a small chapel, where the pilgrim was allowed, for money, to kiss a gigantic bone, said to have been the fingerbone of St Peter. After this, he was conducted to a building, thatched with reeds and straw, enclosing two wells in high repute for indigestion and headache, and also for the more rare virtue of ensuring to the votary, within certain limits, whatever he might wish for at the time of drinking their waters. The building itself was said to have been transported there through the air, many centuries before, in a deep snow; and, as a proof of it, the visitor was gravely pointed to an old bear's skin attached to one of the beams. After this, he entered the outer chapel, an unfinished building at the time of Erasmus, who describes the high winds from the neighbouring sea blowing through its open doors and windows. Within this stood the chapel of the Virgin; a small wooden building, with a door in its opposite sides, through which the pilgrims entered and retired. The celebrated image of Our Lady stood within it on the right of the altar. The interior was kept highly perfumed, and illuminated solely by tapers, which dimly revealed the sacred image, surrounded by the gold and jewels of the shrine. The pilgrim knelt awhile on the steps of the altar in prayer, and then deposited his offering upon it, and passed on. What he gave was in stantly taken up by a priest, who stood in readiness, to prevent the next comer from stealing it in depositing his own offering. At an altar, apparently in the outer chapel, was exhibited the celebrated relic of the Virgin's milk. It was enclosed in a crystal, to prevent the contamination of lips,

> ——— "Whose kiss
> Had been pollution unto aught so chaste,"

and set in a crucifix. The pilgrims knelt on the steps of the altar to kiss it, and, after the ceremony, the priest held out a board to receive their offerings, like that with which tolls were collected at the foot of bridges. The sacred relic itself, Erasmus says, was excessively like chalk mixed with the white of eggs, and was quite solid. The image of the Virgin and her Son, as they made their salute, also appeared to him to give them a nod of approbation.

An incident of a personal kind illustrates the bigotry and intolerance which prevailed at these places. After the ceremony of kissing the sacred milk, Erasmus requested his friend to inquire for him, in the mildest manner, what was the evidence that it was indeed the true milk? The priest appeared at first not to notice the question; but, on its being repeated, his countenance assumed an expression of astonishment and ferocity, and in a tone of thunder he asked if they had not authentic inscriptions of the fact? From the violence of his manner, they expected every instant to have been thrust out as heretics, and were glad to make their peace by a present of money. The inscription which he referred to was found, after some search, fixed high upon a wall, where it was scarcely legible. They contrived, however, to read it; but found it to contain merely a history of this precious relic from the tenth century, when it was purchased by an old woman near Constantinople, with an assurance, from which arose its fame, that all other portions of the Virgin's milk had fallen on the ground before they were collected, while this was taken directly from her breast.

At Canterbury, which Erasmus has also described, there appears to have been less variety of incident. The pilgrim was there chiefly employed in doing honour to the relics of almost countless saints, and pre-eminently to those of Becket. "On the north side of the choir," he says, "the guides opened several doors, and the pilgrim beheld an immense collection of bones of all kinds—skull-bones, jaw-bones, teeth, hands, fingers, &c. which they kissed as they were severally taken out." At his visit an arm was presented to them to salute, with the flesh still upon it, and bloody. In doing honour to the relics of Becket, they kissed the rusty point of the sword that split his skull, and the fissure in the skull itself, exposed for that purpose in a silver case. Near his monument their eyes were gratified with the sight of his hair-shirt, his belt, and trowsers. His neckerchief was also shown them, dirty with his sweat, and spotted with his blood; and even the rags on which he blew his saintly nose, still bearing evidence of their use. Such exhibitions were perfectly consistent with the genius of canonization, and with that love of disgusting subjects, which was not unfrequently mingled with ideas of sanctity.

All pilgrimages to canonized shrines were professedly devotional; but they had often a near relation to some personal want or secular interest of the devotee. This arose from that subdivision of the Romish as of the classical calendar which assigned a tutelary deity to almost every situation or contingency of life; and in consequence filled the country with shrines of a pacific virtue. The superstition here alluded to is quaintly detailed in a passage in Sir Thomas More's "Dyalogue on the Adoracion of Ymages."

"We set," says the interlocutor of the dialogue, "every saint in his office, and assign him a craft such as pleaseth us. Saint Loy we make a horse-leech; and because one smith is too few at the forge, we set Saint Ippolitus to help him. Saint Appolonia we make a tooth-drawer, and may speake to her of nothing but sore teeth. Saint Sythe, women set to seek their keyes. Saint Roke we appoint to see to the great sickness, and with him we join Saint Sebastian. Some saints serve for the eye only, and some for a sore breast. Saint Germain only for children, and yet will he not once look at them, but if their mothers bring with them a white loaf and a pot of good ale. And yet is she wiser than Saint Wylgeforte; for she, good soul, is, as they say, content to be served with oats, peradventure to provide a horse for an evil husband to ride to the devil, for that is the thing she is so sought for; insomuch that women have changed her name, and, instead of Saint Wylgeforte, call her Saint Uncumber, because they reckon that for a peck of oats she will not fail to uncumber them of their husbands."

The enumeration here given might be carried much further. Saint Anne, for example, was supposed to have a peculiar efficacy in recovering lost goods; and Saint Leonard in assisting debtors to escape from prison. St Sebastian was all-powerful against the plague, Saint Petronel against fevers, Saint Genow against the gout, &c. In the same manner every trade had its patron saint; and even the cat-catcher could hope for no success in his profession, without the kindly interference of St Gertrude. From the same local and specific efficacy, some shrines that were uncanonized enjoyed a repute little inferior to those which could boast of a celestial patron. A singular shrine of this kind existed at Winfarthing, in Norfolk, containing a precious relic, called "the good sword of Winfarthing." It was efficient in the recovery of lost property, and of horses stolen or strayed, and in the still more important office of shortening the lives of refractory husbands. To obtain its interference in this way, the impatient help-mate was simply required to enter the church on every Sunday through the year, and set up a lighted candle before the relic.

The pilgrimages to sanative wells and fountains must be reckoned among those to specific shrines. Springs of this kind, when consecrated, were generally found in the neighbourhood of some chapel, or monastery, of their patron saint, within which a part of the ceremony usually took place. The counties of Norfolk and Suffolk contained sanatory wells, of various efficacy at Woolpit, East Dereham, Wereham, Bawburgh, &c. The effect of these wells was probably not always imaginary. In many instances, a medical as well as a religious benefit might arise from the ceremony which the visitor underwent. Thus, at Saint Nun's pool, in Cornwall, celebrated for curing madness, the treatment of the patient might, from physical causes, have this effect. The sanative stream was received into a large square cistern, capable of being filled to any depth. The lunatic was made to sit upon the brink, with his back to the water, and, by a sudden blow on the breast, was tumbled headlong into it. Before he could recover himself, he was seized by a strong man, placed there for the purpose, who lifted him in his arms, and whirled him about in the water till he was completely exhausted. When he thus became quiet, it was supposed that his reason was returning, and in this state he was carried into the neighbouring church, where masses were said over him; and if he recovered, as it is said he frequently did, the honour was given to Saint Nun.

In some instances, the imputed efficacy of these wells was of a moral kind. The wells of Saint John and the Virgin at Honiley, in Warwickshire, were celebrated for removing the taint of unchastity. The pilgrimages to them were made by both parties after the birth of their offspring. The man bathed in the well of Saint John, and the female in that of the Virgin, both being filled from the same spring. Having made this ablution, they went to the neighbouring church, and crept on their knees to the shrines of the respective saints, beseeching them to intercede with our Saviour for their forgiveness. They then made an offering at the altar, and the priest gave each a bottle of the water of the spring, as a preservative against future offences. At many of the wells, however, as at the wishing wells of Walsingham, the ceremony consisted in drinking of the waters, after which the devotee knelt upon the margin, repeating the things he desired, and throwing in pieces of gold. In the ancient form, which was purely pagan, crooked pins only were thrown in "to the genius of the spring," or scraps of the garment of the pilgrim attached as a memorial to the neighbouring bushes. This custom continued to the last at Whiteford and other undedicated wells. But when the waters were rescued from their pagan patron, and placed under the charge of Christian saints, it was a natural change to substitute some more valuable gift.

The custom of performing pilgrimages by proxy was perhaps a consequence of the Catholic doctrine, that an individual might, on some occasions, depute his religious duties to others, without detriment to himself. Generally, however, these pilgrimages were performed only after the demise of the person to whom they referred, though a few instances occur of their taking place in his lifetime. Provisions for these post obit pilgrimages are frequently met with in the wills of distinguished persons, from the twelfth to the sixteenth century. In the earlier instances, they were commonly directed to Rome or Jerusalem, and in these cases were committed to priests, who were directed to pray or sing masses at all convenient places by the way. But in later ages, like other pilgrimages, they were more commonly made to domestic shrines, and appear to have been intrusted to simple laymen. A pious lady, whose will is printed in Blomefield's Norfolk, provides for a pilgrim to visit, after her death, no less than eight different shrines within that county. It is probable, from the low rate at which these spiritual commissions were generally paid, that the same person undertook several of them at once. In the will of lady Cecily Gerbridge, in 1418, only ten marks are left for a pilgrim to visit Rome; and in another, that of Gardiner, bishop of Norwich, in 1508, only twenty marks are left for the same pilgrimage, with the condition of singing at Rome there for thirteen weeks. In some few cases, the executors of a will were directed to give certain sums to all pilgrims, without distinction, who were willing to undertake an assigned pilgrimage for the deceased. The same system of vicarious duty prevailed in the crusades; but at first the privilege of deputation was confined to persons of the same rank. A father often bequeathed a crusade to his son, and assigned him by will certain funds for his expenses; and the son, again, perhaps satisfied his conscience by transferring it to his own heirs. This delay, however, arose partly from the long intermission of crusades, in which alone such hostile service could be performed; and the duty thus often continued to be acknowledged for several generations. In the will of Sir Roger Beauchamp, in 1379, he confesses that, by the devise of his grand-father, he was bound to do service in the Holy Land, to the expense of two hundred marks; but having never performed it, he now transferred the duty, with the funds for it, to his grand-son, to discharge for him.

The practice of making valuable presents to shrines, though not assuming the form of pilgrimages, was very nearly allied to them in spirit. These presents were made annually, or at other periodical intervals, by most persons of rank in Catholic ages. It appears from the household book of the earl of Northumberland that he gave donations every year to several popular shrines, and kept a candle constantly burning at some of them, with a provision for a priest to attend it. Edward I. appears to have made periodical offerings to nearly one hundred shrines; and his queen is recorded to have given twelve florins of gold for herself and her son, to the several shrines of Becket at Canterbury, with three florins more for the infant with which her majesty was then pregnant. It was common in sickness for the invalid or his friends to tempt the intercession of a saint by vowing to present quantities of corn, bread, or wax at his shrine, the precise quantity being generally determined by the weight of the patient. In one of the Paston Letters, Margaret Paston informs her brother, that his mother had vowed an image of wax of his weight to Our Lady of Walsingham, and that she was going to the same shrine, on a pilgrimage for him. But the most valuable presents of this kind were those made by bequest. Ladies, at their death, often left their richest dresses and most costly jewels to the shrines of their favourite saint; and it was probably in this way, as much as by pilgrimage, that their immense wealth was accumulated. A most splendid bequest of this kind occurs in the will of Richard Beauchamp, earl of Warwick, in 1435. He directs his executors to cause four images of pure gold, each containing twenty pounds, to be made in the likeness of himself in his coat of arms, and holding an anchor between his hands; one to be given to the shrine of St Alban, another to St Thomas of Canterbury, a third to Bridlington, in Yorkshire, and a fourth to St Winifred, at Shrewsbury.

One reason, probably, for making gifts in this form, rather than in money, was to ensure their permanent attachment to the shrine to which they were given. To what degree this precaution was necessary is not known—or what was the precise law affecting the property of offerings. At shrines, like that of Becket, it may be supposed, from their immense wealth, that a great part of the presents were preserved; but at many of the lesser ones the priests avowedly claimed the gifts as their own. At the celebrated image of Our Lady in St Paul's, even the candles set up by devotees were not allowed to burn, but were regularly taken down and carried to a room below the Chapter-House, where they were melted down as a perquisite of the canons. The same appears to have been the case with the offerings at nearly all the shrines in London; and from the loss of this source of revenue, the value of many of the livings was sensibly diminished at the Reformation.

To this cause may also perhaps be attributed the excessive number of rural shrines. Under strong temptations of gain, there will never be wanting persons in any profession to take advantage of ignorance and credulity; and such disinterested forbearance was least of all to be expected in the clergy of the middle ages. The history of one of the absurd relics mentioned in the preceding pages, the good sword of Winfarthing, is probably a fair sample of that of a majority of the shrines, if their origin could be known. This precious relic was originally the sword of a robber, who took sanctuary in the churchyard, but escaped through the negligence of the watchman, and left this sword behind him. It was laid up for many years in an old chest; but the parson and clerk at length striking on the idea of proclaiming it as a relic, drew it from its obscurity, and made a handsome revenue of their device. "The taking up of a man's bones," says Sir Thomas More, "and setting them in a gay shrine, hath made many a saint." The image of the Virgin at Worcester, when unfrocked by the reformers, was found to be the statue of one of their bishops.

Many of the shrines were as mean in external apparatus as they were absurd in purpose. The jealousy of Alexander on the subject of his portrait, might have been adopted at them with good effect. The usual representation of God the Father resembled "an old broken-backed man, with a white head and beard, a wrinkled forehead, large hanging lips, and toothless gums." It is probable, however, that this description might apply chiefly to the smaller shrines. The richer ones were often furnished with great sumptuousness, and, like the magnificent edifices in which they were placed, were well calculated to inspire the awe and wonder of a rude and barbarous people. Many of them were of solid gold, or richly gilt and set with jewels. Tapers were continually burning before them; banners were suspended over them, and sometimes the effigies of knights, in complete armour, stood around them, as if for a guard.

There can be no doubt of the injurious effects which, in some cases, arose from pilgrimages, and especially those of the lower orders. In almost every town and neighbourhood, the loose and idle part of the population seem to have been the most persevering pilgrims. The interlocutor before quoted in Sir Thomas More's Dyalogue observes that "the most part that cometh, cometh for no devotion at all; but only for good company to babble thitherward, and drinke dronke there, and then dance and reel homeward. Many that seemeth an honest housewife at home, hathe helpe of a bawde to bring her to mischief as she walketh about upon her pilgrimages." But so far as positive evidence goes, the pilgrimages of the better classes were more severe in their character, or at least more decorous. Instances might occur of their being converted into licentiousness; but they were probably productive, on the whole, of far more good than evil. A part of the imputations under which they lie arose from the conduct of persons who were merely pilgrims in disguise. There were love pilgrims, trading pilgrims, pilgrim adventurers, &c., whose objects had scarcely in profession any connection with religion. Of course, the crimes or irregularities of such maskers cannot with any fairness be charged upon those who assumed the profession in reality.

PLIOCENE PERIOD, in geology, constitutes the last division of the tertiary strata, or that immediately preceding the recent era. The term is derived from *πλειων*, greater, and *καινος*, recent, as the greater proportion of the fossil shells found in these deposits are recent. Of 226 shells found in the Sicilian beds, 216 were of existing species. The Pliocene strata are divided into newer and older. The district around Naples, and a portion of the strata of Sicily, belong to the newer; the Subappennine deposits in Italy and Tuscany, to the older.

POCOCK, Isaac, the writer of several popular dramatic pieces, was born at Bristol, 2nd March, 1782. When a child he evinced a talent for drawing, and he was placed first as a pupil with Romney, after whose retirement he studied under Sir William Beechey, by which means he acquired the bold style of the former with the richness and delicacy of colouring of the latter. In 1805 "The British Institution for the promotion of the Fine Arts" was established in Pall Mall, and as a student there he distinguished himself by some very fine copies of pictures of the ancient masters. In 1807 he entered the lists with numerous competitors for the first prize given by that Institution for the best original historical painting; he chose for his subject the Murder of Thomas à Becket, and gained the prize. After this encouragement, he painted several other historical and poetical subjects, as well as portraits, in all of which there was so much merit, that, had necessity compelled him to devote his undivided attention to the art, and to prosecute it with industry, he would doubtless have realised the expectations formed of him by his old masters and his friends, by attaining a high rank amongst the artists of his day. But, having the prospect of an independent fortune, being young, and mixing much in society (for which his varied accomplishments, originality of humour, and agreeable manners peculiarly fitted him), he gradually relaxed in the prosecution of that profession. About this time also, on the suggestion of a friend, he tried his powers as a dramatist; and, the attempt succeeding, he made further contributions to the drama from time to time, and, although celebrity was not sought by him, he eventually became known as one of the most successful dramatists of his day. In 1818, he succeeded to the property of his uncle and aunt, Sir Isaac and lady Pocock, and took up his residence at Maidenhead, where he employed himself in the duties of a country gentleman, at times using both his pencil and his pen, and producing works which show how highly he was gifted. Some of his poetical pieces are found with the fugitive literature and music of the day. His last historical painting was an altar-piece ("Our Saviour blessing little Children") presented by him to the new chapel at Maidenhead. During his residence in London, at the period of Bonaparte's threatened invasion, he was appointed first lieutenant of "The

Royal Westminster Volunteers," whence he was raised to the rank of major by the suffrage of its members; and he had not long been resident at Maidenhead before he was joined in the commission of the peace for Berkshire; and in July, 1831, appointed one of his Majesty's deputy lieutenants for that county. He was active and energetic in the performance of the duties which devolved upon him as a magistrate or otherwise; and in all the relations of private life his conduct was exemplary. He died after a few hours' illness on the 23d Aug. 1835.

His first dramatic essay was the musical farce of Yes or No? produced at the Haymarket in 1808; this was followed in 1810 by two lively, bustling pieces, viz., Hit or Miss, and Seventy Years Ago; the former rendered famous by the inimitable acting of the late Charles Mathews in the character of *Cypher*, and both first acted at the Lyceum. Added to these, his most successful productions were, Any Thing New, a musical farce, 1811; The Green Dragon, another; and Harry Le Roy, a burletta, (altered from the Miller of Mansfield,) all in 1811; The Miller and his Men, a melodrama, 1813, which, by aid of the sweet music of Bishop, still retains a place on the stage; For England Ho! an opera, 1813; John of Paris, an opera, 1814; Zembuca, a melodrama, 1814; The Magpie or the Maid? a melodrama, 1815; Robinson Crusoe, a pantomimic Easter-piece, 1817; Rob Roy, an opera (dramatised from Scott's novel,) 1818; Montrose, a musical drama, 1822; Woodstock, a drama, in five acts (from Scott's novel,) 1826; The Robber's Wife, a melodrama, 1830; The Corporal's Wedding, a farce, 1830-1; The Omnibus, an interlude, 1831, Country Quarters, a farce, 1832; The Clutterbucks, a farce, 1832; Scan-Mag, a farce, 1833; The Ferry and the Mill, a melodrama, 1833; and King Arthur and the Knights of the Round Table, a Christmas equestrian spectacle, 1834-5. We may mention, as less successful, The Farce Writer, which christens itself; The Heir of Veronia, a opera, 1817; The Libertine, ditto, 1817; The Antiquary, a play (from Scott's novel, afterwards redramatised with better success by Mr Terry,) before 1820; Husbands and Wives, a farce, 1817; Alfred the Great, or the Enchanted Standard, a musical drama (partly founded on an early production of O'Keeffe's,) 1827; Tucki Tomba, an Easter-piece, 1828; Peveril of the Peak, an opera, 1826; The Blue Anchor, a nautical drama, 1830; The Doom Kiss, a musical drama, 1832; Anster Fair, an Easter folly, 1834; and two pieces produced since his death, one a farce, called, The Night Patrol, and the other an adaptation of Sir Walter Scott's novel of Old Mortality, under the title of Cavaliers and Roundheads.

POISONING. Perhaps there is nothing, in which the progress of civilization is more distinctly marked, than in the increased tenderness which is felt for human life. This may, at first, seem a paradoxical remark in the generation immediately succeeding what may be called the *age of the guillotine* in France. But after that dreadful and convulsive crisis was passed, the amelioration over the preceding century was visible. Napoleon himself had not the power to re-enact the tragedy of Patkul; and the execution of the duke d'Enghien was as fatal to him, in public opinion, as the invasion of Spain was in political influence. His reign, all things considered, was by no means bloody. The recent changes in France, nearly as they have verged toward the character of a bloody revolution, have yet escaped it. In the works of English illustrative history, the portraits of half the eminent noblemen and statesmen, two centuries ago, contain the fatal axe, among the ornamental work of the engraving; expressive symbol of the fate of the original. But the great of the present day die in their beds, with no worse enemy to fear than gout and old age.

Nor is the frequency of assassination less diminished, than that of judicial destruction of life. The tales one reads of Neapolitan bravos, whose poignard can, at any time, be hired for a ducat, if ever true, are, we suspect, true no longer. Men are neither for themselves, nor for hire, so easily moved "to break into the bloody house of life." Life is more precious than it was. Every man has a higher consciousness of his own value, in proportion to the advance of civilization; and he measures the value of another's life by his own standard. Society better protects its members. The laws reign. As the State does not set an example of being profuse of human blood, private hatred feels the restraint of public opinion. The great feudal powers are broken down, under whom a sort of private war, fatal to security of life and property, was carried on, and both were sacrificed, without the absolute odium of robbery and murder. The abolition of religious asylums has driven out the desperado from his shelter in the church. The great facilities of communication have lent wings to that instinct with which retributive justice rushes out upon the traces of the murderer, and dogs him to the deepest retreats in the remotest countries. But these all, as it seems to us, resolve themselves into the greater tenderness with which life is regarded, and the higher value attached to its preservation.

There have been periods of the world, when every great man, king, prince, minister, or favourite, was deemed in danger of poison; when not a morsel of food was swallowed by the unhappy potentate, till it was tasted. Poisoning is now an insulated crime. No one fears it, more than he fears assassination in any other way, or highway robbery. As it requires neither strength nor nerve for its perpetration,—nothing but deadly malice,—it must, of course, retain its place among the crimes which fix their stain on humanity. In the present day, solitary cases occasionally occur,* but in almost every age of the world, down to the middle of the last century, the poisoner's calling was in some countries, to a certain degree a profession, not to say a department of the government.

We do not here allude to the open use of the hemlock, as a means of inflicting capital punishment, but to the employment of poison, as a secret method of destroying persons obnoxious to public or private hate. It is a beautiful anecdote, which is told of Alexander the Great, that, being seized with a fever, after crossing the Cydnus, he was warned by Parmenio, in a letter, not to taste the medicine, which his physician offered him, for fear of poison. Alexander gave the letter to Philip, (that was the physician's name) to read, and the calm and tranquil air of Philip satisfied the ailing conqueror, that he might safely drink the potion. But it was an uncertain test, and proved self-possession rather than innocence. Philip, a king of Macedonia, not the father of Alexander, understood the convenience of a secret poison. He is said by Plutarch, when he had become weary of his connection with Aratus of Sicyon, to have given him, "not a sharp and violent poison, but one of those which induce first a slow fever and a dull cough, and so by degrees bring on a consumption." Aratus knew with whom he was dealing, and having, a short time before his death, raised blood, said, "such are the rewards of royal friendship." The Persians greatly excelled in the art of poisoning. Plutarch and Ctesias relate, that queen Parysatis, the mother of Cyrus the younger, put to death her daughter-in-law Statira, by means of a knife poisoned on one side of the blade. A bird was set before the two queens, at supper; it was divided by the poisoned knife; Parysatis ate her half with impunity; Statira died. Eminent men, in the convulsive struggles of the ancient republics, frequently carried a little poison about them, that they might, if necessary, by suicide, escape a painful and ignominious death. Demosthenes carried his in the hollow of his stylus, and Hannibal's was concealed in a ring.

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* In 1838, a married woman was executed at Glasgow, for poisoning. She let lodgings to wayfarers and working people at Carluke, a small town in the upper ward of Lanarkshire; and having been intrusted with a sum of money (five or six pounds) by a highland out-door labourer, till the fall of the year, when he should return to his home in the far-off Hebrides, she was convicted of administering arsenic to him in his porridge, in order to silence his claim upon her for his hard earned savings. She was also convicted of having previously administered arsenic to a poor old bed-ridden woman, who occupied an apartment in her house, for no other good reason that could be assigned, than in order to make room for a daughter who was on the eve of getting married. The evidence against her, it may be remarked, was very strong, but not in all its points completely satisfactory, and it was rendered more doubtful by the fact of her persisting in her innocence to the last.

It is not easy to ascertain what the preparation was, which was employed by the ancients, and produced sudden death, by the exhibition of small quantities; for although there is probably much exaggeration on subjects of this kind, yet it is impossible to doubt, that some such noxious preparations were known to the ancient world. Theophrastus says, that the poison of most subtle operation was extracted from Wolfsbane (Aconitum); that it could be so prepared, as to operate in two or three months, or at the end of a year or two years. No antidote had been discovered to this poison, and it was a capital crime to have the plant, from which it was extracted, in one's possession. If we are to understand by this, that a dose could be administered, which would take effect, at a calculated and distant period, it is probably fabulous. If it be meant only, that by feeding a man with weak wolfsbane tea for months and years, his health might be gradually destroyed, it is credible. In that sense, Dr Johnson even admitted the genuine leaf of China itself to be "a slow poison."

Livy tells us, that poisoning never became a matter of judicial inquiry in Rome, till near two hundred years before the Christian æra. About this time, several persons of distinction went off with the same disorder, at about the same time. The fear of pestilence disturbed the city. Quintus Fabius Maximus was then the Curule Ædile, and a female slave came to him and promised, on condition of her own pardon, to disclose the names of those who were guilty. Quintus Fabius Maximus never proceeded rashly; and though even he might have been forgiven a little hurry, in despatching matters with a confessed poisoner, yet he laid the case in due form before the consuls, and they before the senate. The stipulated pardon was granted, and guided by the maid the officers of justice discovered the poisoners,—ladies of the noblest families of Rome, busy around the cauldron "*coquentes quædam medicamenta, alia recondita inveniunt.*" Twenty were seized; two of them, (one was a Cornelia, the other a patrician,) undertook to speak for the rest, and declared that the drugs were medicinal. *Drink them then, yourselves*, was the short reply. They desired permission to consult their sisterhood on that point, and all (hags, if you please, but Roman hags) agreed to the test. They all drank and died. A hundred and seventy more of the noblest ladies of Rome were seized, on similar information, and condemned. Before that day, exclaims the perturbed Livy, "there never was an inquest of poisoning. The thing was now deemed a prodigy, the act not so much of depraved as of crazed minds." Following the memorable example of what was done in former great calamities, it was resolved by the senate, to have a nail driven into the temple of Jupiter. A dictator is appointed for that mystic duty,—a master of the horse named, a nail driven into the temple of Jupiter, and a stop put to poisoning for two or three centuries. Did the Roman ladies, the Cornelias and the Sergias, poison their husbands by the hundred;—did the Salem witches torment the afflicted? Human nature is the same in all ages. Happy the people that, when a calamitous delusion arises, can hit the nail, that will stop it, on the head!

After the overthrow of the commonwealth, the old republican talismans lost their charms. The driving of nails lost its efficacy. Poisoning grew common, proverbial, poetical. Canidia was a poisoner, and nothing before or since Shakspeare is comparable to the pharmacy of the weird sisters in Macbeth, but that of Canidia, Sagana. and Veia, in the fifth Epode of Horace.

> Canidia, brevibus implicata viperis
>   Crines et incomptum caput,
> Jubet sepulchris caprificas erutas,
>   Jubet cupressos funebres,
> Et uncta turpis ova ranæ sanguine
>   Plumamque nocturnæ strigis,
> Herbasque, quas Iolcos atque Iberia
>   Mittit, venenorum ferax,
> Et ossa ab ore rapta jejunæ canis
>   Flammis aduri Colchicis.
>
> "Her head with knotted vipers hung,
> 'Twas thus the haggard sorceress sung:—
> 'First the wild fig thou must bring,
> Which through rifted grave did spring;
> Eggs and plume of midnight owl
> In filthy frog-blood smeared and foul;
> Herbs of Jolcos and of Spain,
> Teeming soil for deadly bane,
> Wrested bone from famished hound
> In Colchian witch-fires burnt and ground.'"

But the times were coming, when Canidia was to whiten into a sister of charity. Poor Canidia's crimes were the offspring of love and jealousy; but Agrippina's—what shall we say of her's? What can we say more fitly, than that they were worthy of the mother of Nero, who after murdering her husband, and him her uncle, to place her son on the throne, was by that son herself murdered, exclaiming, as she died, to her unnatural offspring, "Pierce that bosom, which could give life to such a monster?" Having determined to destroy Claudius, she took counsel of Locusta, a creature but lately convicted of poisoning, and "long kept among the engines of government!" By this skilful agent a poison was prepared, which should do its work gently, to avoid the dangerous *éclat* of a sudden catastrophe; a wasting and torpid poison, lest Claudius, returning to his senses in the agonies of a sudden death, should forgive his son; an exquisite poison, which should shake the reason, without bringing on a speedy dissolution. Claudius finding unexpected relief from some medical applications, Agrippina was terrified; but the court physician, Xenophon by name,—*Græculus esuriens*,—assisted the agonizing monarch to a bolus of sharper efficacy, and soon sent him on that *anabasis*, from which there is no return. Locusta deserved well of Nero, and was entitled to the continued patronage of the imperial family. Nero was unwilling that the engines of the government should rust by disuse. As Claudius had been removed for fear he should raise Brittanicus, his son, to the throne, it occurred to Nero that the work would be more effectually performed if himself were put out of the way. Locusta was again consulted, and prepared a grace-cup for the doomed prince. Locusta was tender of her character; like lord Bacon, she was a friend of moderate counsels, and she gave the son of Claudius, as she had given his father, a slow and wasting draught. Nero called the considerate sorceress into his imperial presence, taunted her with having the fear of the *Lex Julia* before her eyes, and enjoined a more vigorous practice; and by way of impressing his advice, beat her with his own august fists, and ordered her to prepare a more active poison in his sight. It was given to a kid;—the animal languished five hours. New threats and blows. The poison is boiled down to twice its former thickness, and being tried upon a pig produced instant death. That, indeed, was drink for none but kings; it was served to Brittanicus by order of Nero, in his own presence and with instant effect. Locusta was pardoned the crimes of which she stood convicted, richly endowed with lands and gold, and entrusted with disciples, whom she might train up, to become engines of the government, as useful as herself. Dr Guillotin, who invented the machine, which so agreeably perpetuates his name, is said to have made personal trial of its efficacy. Phalaris, when the brazen bull was brought him, complimented its contriver with a roast in it, as the person best entitled to make the first experiment of its admirable construction. Locusta appeared to think, that as Nero had directed her kind offices to others, he was entitled to them himself; but she failed in the attempt; an attempt, it need not be said, which no one fails in twice. But she will live immortal in Tacitus and Juvenal, as long as flesh knows how to creep, or blood to curdle.

Aulus Gellius has preserved a tradition, touching the fortitude and magnanimity of Regulus, as he found it in an ancient author now lost. The standard writers do not confirm it; but it ought to be true, for it is incontestably the most striking illustration of Punic faith, which history has preserved. The common version of the history runs, that the Carthaginians, placing full reliance on the honour of Regulus, whom they had made captive, sent him to Rome, to propose an exchange of prisoners, on the condition, that, if the Romans did not consent, he would return to his captivity, in Carthage. Cicero thought he gave Regulus credit for sufficient magnanimity, in making him counsel the senate not to consent to exchange him, aged and worn out as he was, for the young African chieftains, who were capable of living to make battle for years. The senate takes the advice of the poor old consul, and sends him back to Carthage to be tortured. But Tuditanus, the lost author cited by Aulus Gellius, ascribes to the Carthaginians a villany of most exquisite texture. They administered to the Roman veteran a secret poison, calculated to take effect in a few months; so that if the Romans agreed to the exchange, they would get nothing but a poisoned old consul, in return for a half score of fervid young Africans. This was pretty well; but unluckily for the fraud, Regulus detected it; he was determined to nip the treason in the bud, and dropping a hint of it to the senate, put them on their guard against being taken in.

The curious reader may again ask, of what these poisons were compounded. Unfortunately for the inquiry, the school of Locusta perished with her, and we have none but vague surmises and downright fables. Juvenal intimates that a red-breasted toad,—a fourlegged ruddock,—yielded a very suitable essence, to be administered by a noble Roman dame to her thirsty lord:

> "molle Callenum
> Porrectura, viro miscet sitiente rubetam."

But the venom of the toad is as fabulous as his jewel. Ugly he is, but an innocent, timid, useful reptile, who has earned a bad name, from an unsightly figure.

The sea-hare, *lepus marinus*, was a favourite dish with the ancient poisoner. It is the *aplysia depilans* of Linnæus. Philostratus pronounces its venom more deleterious than that of any other animal in the sea or on land. Nero frequently served it up to his guests, and Domitian treated Titus to the same dainty fare. With the more virulent mineral poisons of the modern pharmacopeia, the ancients were not acquainted; and the best praise we can give the Roman or the Grecian venefica is, that she did her best with the means which the state of the arts afforded her.

But at length every thing like regular practice broke down. The empire became degenerate; repeated invasions of barbarians, bringing their own uncouth Scythian venoms with them, destroyed every thing like classical poisoning. It was no longer taught in regular institutions, like that of the discreet Locusta; nor were its professors set apart, among the engines of government, as under the venerable Claudius and the amiable Nero. In the ages of barbarism, the dark, dreary, and illiterate ages of the empire of the East, and the empire of the West, there was an unrecorded, promiscuous, vulgar practice of all the arts of assassination; an unlicensed and empiric use of the bowl and the dagger, which really affords nothing on which a scientific curiosity can repose with pleasure.

But Leo's golden days arrive. With the other sister arts, that of poisoning started into life, and not only, like eloquence, "shook the poppies from her brow," but began to concoct them into a quieting draught for her neighbour's lip. Pope Alexander VI. and his son Cæsar Borgia, invited nine newly created cardinals to dinner, with a view of despatching them by poisoned wine. By the error, or possibly the design, of the attendants, the wine was served to the pope and his son. The latter by superior strength of constitution escaped; Alexander died. Pope Sistus V. is supposed to have been poisoned. He was a contemporary with Philip II. of Spain, who was wont to call the poison, of which he commonly made use, his *requiescat in pace*. Sistus used to say to Philip s ambassador at Rome, "know Mr Ambassador, that we fear nothing from your master, but one of his *requiescats in pace*." He had reason to fear them, for he died their victim.

But the mistress of this art, did not make her appearance at once. It was in the latter part of the seventeenth century, and the commencement of the eighteenth, that Toffana flourished. This lady lived first at Palermo; but a professor so skilful of an art so useful, could not long be confined to a provincial sphere. About the close of the seventeenth century she removed to Naples. She contrived a delicate preparation of arsenic, dissolved in a decoction of *Antirrhinum Cymbalaria*, of which from four to six drops were supposed to be enough to destroy a man. It entered freely into commerce, and was known by the name of *aqua della Toffana*, more exquisitely *acquetta de Napoli*, and even *acquetta*. In common cases, of course, Toffana was paid for her panacæa; but she had a heart open as day, to melting charity, and ladies, who wished to cultivate the mortifying graces of widowhood, were supplied gratis. But though an admiring and grateful public bestowed on her invention the name mentioned, thus securing to her the credit, to which she was so justly entitled, she herself was more modest, and waived that honour. The sarcophagus of St Nicholas at Bari distils a certain oil, endowed with marvellous virtues to heal diseases, and sold all over Italy under the name of Manna of *St Nicholas of Bari*. Toffana, considering that if her little arsenical syrup did not actually cure diseases, it put the patient out of misery, which might be regarded as the next best thing, prepared it in small phials, stamped with the image of good St Nicholas of Bari, and labelled, as his manna. Father Labat, in his travels in Italy, mentioning this fact, observes, that it was attended with the great advantage, that as the manna of St Nicholas was a well known, and withal a sacred article, Toffana's counterfeit, under that name, passed the custom-house with little scrutiny: a pleasing illustration of the demand for this delicate chemical preparation, in the kingdom of Naples. One of these bottles, according to Dr Marx, is said to be still in existence at Cologne.

But poisoning, though in great repute, was not positively lawful in the kingdom of Naples; and the government at last began to bestir itself. Disquieted by this circumstance, Toffana took refuge in an ecclesiastical asylum, where, under the privileges of the place, she bade defiance, for some time, to the officers of justice, and continued to vend her catholicon from the very bosom of the church. But the scandal became at length too great to be borne. She was dragged from her refuge and thrown into prison. A great outcry was raised by the clergy at this violation of their privileges, and the people, unwilling to be defrauded of their right to be poisoned, joined in the clamour of the priests. It was only by circulating a report, that she had poisoned the wells in the city, that the current of public sentiment could be turned against her. Being put to the rack, she confessed her enormities; named those who had afforded her protection, who were immediately dragged from churches and monasteries; and stated that the day before her last flight from justice, she had sent two boxes of her manna to Rome. It was found in the custom-house in that city, but it did not appear that it was sent to order. It was a little speculation of Toffana's, on her own account. The archbishop still murmured at her being torn from a privileged asylum; and, accordingly, to cut the matter short, she was strangled and thrown into the court-yard of the convent, from which she had been taken. But her art did not perish with her; and, according to Keysler, who travelled in the former part of the eighteenth century, and saw Toffana in confinement, her *acquetta* continued to be prepared, in great quantities, after her execution.

We have somewhat anticipated the order of events in relating the history of Toffana. A hundred and fifty years before that lady flourished, the art was introduced into England. But lord Bacon, who performed the duties of attorney-general, in the case of Sir Thomas Overbury, maintains, that poisoning is not a crime to which the English people are predisposed, "*non est nostri generis nec sanguinis.*" He justly sets forth the enormity of an offence, whereby a man is taken off, in full peace, and thinking no harm, and while he is comforting and refreshing nature with his food. It is a crime the more to be dreaded, because it is so easily committed, and so hard to be prevented and discovered. Other murders are committed *cum sonitu;* with acts, that may discover or trace the offenders; but this comes upon a man when he is careless and without suspicion, and every day he is in the gates of death. Nor does it only concern the man, against whom the malice was intended, but it was often proposed for one, and taken by another, as in the example of 21 Henry VIII., where the purpose was to poison one man, and being put into the broth, sixteen of the bishop of Rochester's servants were affected.

This extraordinary instance of the crime of poisoning produced such an effect upon the legislature of Great Britain, that the following year a law passed, making murder by poisoning high treason, and inflicting upon it the singular punishment of *boiling to death*. We have thought it worth while to copy the preamble of this act, a document throwing some light on the manners of the age, and particularly illustrating the opinions entertained by our worthy ancestors of the age of Henry VIII. on the subject of *ex post facto* laws.

22 Henry VIII. c. 9. "The kynges royall majistie callyng to hys moste blessed remembraunce that the makyng of good and holsome laws and due execution of the same agaynste the offendours thereof is the only cause that good obedyence and order hath ben preserved in this realme, and his Highnes havyng moste tender zeale to the same emonge other thynges consyderyng that mannes lyfe above all thynges is chyefly to be favoured, and voluntary murders moste highly to be detested and abhorred, and specyally of all kyndes of murders, poysonynge, which in this realme hytherto our Lord be thanked hath ben moste rare and seldom comytted or practysed; and now in the tyme of this presente parliamente, that is to saye, in the xviij daye of Februarye in the xxijd yere of his most victorious reygn, one Richarde Roose, late of Rouchester in the countie of Kente, Coke, otherwyse called Richard Coke, of his most wyked and dampnable dysposicyon dyd caste a certeyne venym or poyson into a vessel replenysshed with yeste or barme standyng in the kechyn of the reverende Father in God John Bysshopp of Rochester at his place in Lamehyth Marsshe wythe which yeste or Barme and other thynges convenyent, porrage or gruell was forthwyth made for his famylye there beyng wherby not only the nombre of xvij persons of his said famylie which dyd eate of that porrage were mortally enfeebled and poysoned and one of them, that is to say, Bennett Curwen gentylman thereof ys deceassed, but also certeyne pore people which resorted to the sayde bysshops place and

were there charaytably fedde wyth the remayne of the sayde porrage and other vytayles, were in lyke wise infected, and one pore woman of them that is to saye Alyce Tryppytt wydow is also therof nowe deceassed: our sayde sovereign lorde the kynge of hys blessed disposicion inwardly abhorrying all such abhomynable offences, because that in manner no person can lyve in suertye out of daunger of death by that meane, yf practyse thereof should not be exchued, hath ordeyned and enacted by auctorytie of thys presente parlyament that the sayd poysonyng be adjudged and demed as high treason. And that the sayde Richarde for the sayde murder and poysonynge of the sayde two persones as is aforesayde by auctorityе of thys presente parlyament, shall stande and be attaynted of highe treason: and by cause that detestable offence nowe newly practysed and comytted requyreth condigne punysshmente for the same; It is ordayned and enacted by auctoritie of this presente parliamente that the said Richarde Roose shall be therfore boyled to deathe without havynge any advauntage of his clargie."

Under this statute, as we learn from lord Coke, in his third institute, Margaret Davy, a young woman, was attainted of high treason, for poisoning her mistress, and some others were boiled to death in Smithfield, the 17th of March, the same year. But this act, continues his lordship, was too severe to live long, and was therefore repealed by 1 E. 6. cap. 12, and 1 Mar. cap. 1. It is not impossible that the proverbial expressions, to keep out of hot water, and to get into hot water, may have had their origin in the cruel punishment attached to this crime, by the law of 22 Henry 8.

It would seem that, by the ancient law of England, poisoning was still more severely dealt with. "Poyson," says lord Coke, (*venenum, a venis quia a venis permeat.*)[*] "is, as hath been said, the most detestable of all, because it is most horrible and fearful to the nature of man, and of all others can be least prevented, either by manhood or providence; and that made Fleta to say, Item nec per patriam se defendere debet quis de veneno dato, sed tantum per corpus suum, eo quod initium facti non fuit tam publicum quod sciri poterit a patria, &c., but that is not holden for law at this day." As well it might not be. Suppose the person accused were innocent.

The case of John Roose illustrates the insular awkwardness of John Bull, compared with the dexterity and taste of his continental neighbours. The exquisite Toffana distils her delicate *acquetta*, and four or five drops are sufficient to do the work. John empties a pound of arsenic into his master's soup-kettle, and poisons half the parish. But the arts improve by time and practice, and under the reign of Elizabeth, that of secret poisoning was introduced from Italy, and flourished under the auspices of no less a personage, than the great Earl of Leicester, the most magnificent subject that ever adorned the British court. Among the persons attached to his household, was an Italian secretary, whom he had brought home from his travels, and who was the reputed instrument with which he removed his victims. There is no great reason to doubt, that many of the tales which circulated about the secret practices of this arrogant favourite, were the product of envy and political hostility. They were so generally believed, however, that persons dying of a sudden death, were said to have gone off by *Leicester's cold;* and Camden, who wrote his work, under the auspices of the lord treasurer Burleigh, gives no doubtful countenance to some of the most atrocious of the insinuations against Leicester. Among his earliest victims was his wife, the gentle Amy Robsart, immortalized by Sir Walter. He married this lady on the 4th of June, 1560; his sovereign, king Edward, was present at the nuptials; and from a passage in his journal, we obtain a knowledge of the somewhat singular bridal festivities of that day. "June 4, 1560, Sir Robert Dudley, third son of the Earl of Warwick, married Sir John Robsart's daughter; after which marriage there were certain gentlemen, that did strive, who should first take away a goose's head, which was hanged alive on two cross posts." After living with him ten years, this poor lady disappeared, "at a very unlucky juncture for the earl's reputation; because the world at this time conceived it might be much for his conveniency, to be without a wife, this island then holding two queens, young and without husbands." She was prevailed upon to visit Cumnor-house, the seat of Antony Foster, one of Leicester's creatures. There the unfortunate lady became ill, —the consequence of the infernal practices upon her,—which however produced their effect too slowly to answer the desired end. She was importuned by Foster and his tool Varney, to take medicine for her disorder. "They, seeing her sad and heavy, as one that well knew by her other handling, that her death was not far off, began to persuade her, that her present disease was melancholy, and other humours, and would needs counsel her to take some potion. This she absolutely refusing to do (as suspecting the worst), they sent a messenger for Dr Bayly, professor of physic, at Oxford, university, and intreated him to persuade her to take some little potion, by his direction. They would fetch the same at Oxford, *meaning to have added something of their own for her comfort,* as the doctor upon just cause and consideration did suspect, seeing their great importunity, and the small need the lady had of physic, and therefore he peremptorily denied their request." As well he might, for a part of this ingeniously contrived plan, was to mix a deadly poison with the medicine, which the doctor might prescribe, and thus throw upon him the responsibility of her death. Her wariness baffled the attempts at poison, and she perished by arts still more atrocious. The superb and remorseless hypocrite who caused her death, bestowed upon her the honours of a splendid funeral; but his own chaplain, in pronouncing her eulogium, stammering under the load of the dark and universal suspicion of foul play, twice in the course of his address, invoked the sympathy of the audience for the fate of the poor lady "so sadly *murdered.*"

The next experiment of Leicester was upon lord Sheffield, who suddenly died, and, as it was charitably rumoured, of a *Leicester cold.* Leicester shortly after espoused the widow, and under the pretence that the queen would be offended at the marriage, compelled her to keep it secret. After some time, the more effectually to conceal the connection, he required her to marry Sir Edward Stafford. This she refused, till under the gentle discipline of Leicester, her hair fell off, and her nails dropped out, and she did what was demanded of her, to save her life. These facts are certified by her own testimony on oath, and atrocious as they are, incredible as they seem, they are related by Sir William Dugdale, and do not appear to be discredited by Camden.

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[*] Lord Coke's Etymology is obscure and doubtful. *Venenum* (of which the first half only is radical, as in Venefica) is, we take it, from an ancient root, with which the English *bane*, the Saxon *bana*, and the Greek *αἰνος*, (dreadful, deadly), are probably connected. The latter word, with the digamma, would give the basis of *venenum.*

The earl of Essex went off in the same way, and for the same cause; but his countess happily survived this western Blue Beard. Besides his two first wives, and the husbands of his two last, there were others who were publicly said "to have travelled the same road, by the same conveyance." The cardinal Chatillon ambassador from France, was poisoned at Canterbury, on his way homeward, and as was believed, by Leicester, out of revenge for the freedom with which the cardinal had expostulated with queen Elizabeth, on the arts with which Leicester defeated her marriage with a foreign prince. Sir Nicholas Throgmorton was seized with a mortal complaint at the earl of Leicester's table, and died before he could be removed. Thus much appears by a letter of Leicester himself to Walsingham. That he perished in consequence of poison given him in the salad, rests upon a tradition in the family, purporting to be founded on the dying asseveration of Sir Nicholas. The earl of Sussex, his great rival, was one of his reputed victims. On his death-bed, he gave this warning to his friends; "I am passing into another world, and must now leave you to your fortunes, and to the queen's grace and goodness; but beware of the gipsy, (Leicester,) for he will be too hard for you all. You know not the beast as well as I do." These dark imputations and many others of like import may be believed, when we reflect that Camden states positively, that Leicester proposed in council, that Mary, queen of Scots, should be removed by poison. The biographer, who records all these facts, adds with commendable simplicity, that "they must be exaggerated at least, if not false, since the earl at this juncture, (that of lord Sheffield's death,) obtained an act of parliament to enable him to erect a hospital at Warwick, which he afterwards did, and plentifully endowed it, that it might bear his name, and preserve his memory, as a most religious person,—the character which, of all others, he most affected,—to succeeding times!" Well done, candour!

We have not space to enter into the atrocious details of Sir Thomas Overbury's tragic fate; the only case, according to lord Bacon, except that of the young princes, of a murder in the tower; and, according to lord Coke, the only instance, in which "any of the nobility of this realm have been attainted for the poisoning of any." The value of this part of the compliment may be estimated, after what we have just related of the earl of Leicester. The indictment against Richard Weston, the keeper of Sir Thomas, set forth, that, on the ninth of May, 1613, he administered to Sir Thomas a poison called roseacre, in his broth, and on the first of June, *ut præfatum Thomam Overbury magis celeriter interficeret et murdraret*, gave him another poison called white arsenic. Further, that, on the 10th of July, the said Richard Weston gave to the said Sir Thomas, a poyson called mercury sublimat, in some tarts; and that another person, by the procurement of Richard Weston, administered the said mercury sublimat to Sir Thomas Overbury; of which several poisons he died. This was unanimously adjudged to be a good indictment, although it did not appear of which of the poisons Sir Thomas died. But the substance of the indictment was, whether he was poisoned by Weston. Weston was tried and convicted, as were also Sir Gervas Helwys, lieutenant of the tower, Richard Franklin, a physician, Anne Turner, and the earl and countess of Somerset, all of whom were executed, except the two last, who were shamefully pardoned by James I. It appeared on the trial, that in addition to the poisons mentioned in the indictment, Franklin prepared several others, as the powder of diamonds, the powder of spiders, lapis causticus, and cantharides.*

Among the actors in this tragedy, who were brought to light and to justice, was Mrs Anne Turner, a female who would have done no discredit to the academy of Locusta. Her trial was accompanied with incidents of a powerful interest. It disclosed that, both on her part and that of her infamous patroness, the countess of Somerset, there was a terrific mixture of superstition, sorcery, love, jealousy, and revenge. Sir Laurence Hyde, after descanting awhile on the wickedness and heinousness of poisoning, stated that "there was one Dr Forman, who lived at Lambeth, to whom the countess of Essex, (afterwards of Somerset) and Mrs Turner used to resort, calling him father. The cause of their coming to him was, that by force of magic, he should procure the now earl of Somerset, then viscount Rochester, to love the countess, and Sir Arthur Manwaring to love Mrs Turner. In the course of his professional dealing as a necromancer, with these modern Canidias, Dr Forman acquired such a knowledge of their fiendish characters, that, before his death, he used to desire, that when he died, he might be buried very deep, "or else," said he, "I shall fear you all." He had good reason, at any rate, to fear them while he lived, for they probably had him poisoned. During the trial, some of his magical apparatus, images, pictures, and enchanted papers, were produced in court. At this moment, "there was heard a crack from the scaffolds, which caused great fear, tumult, and confusion among the spectators, and throughout the hall, every one fearing hurt, as if the devil had been present, and grown angry to have his workmanship showed, by such as were not his scholars. When the panic had a little subsided, more of "the cunning tricks" were exposed. There was, also, a note showed in court, made by Dr Forman, and written on parchment, signifying what ladies loved what lords in court. But the lord chief justice would not suffer it to be read in open court." "The good natured world," adds the fair and accomplished writer from whom we borrow the anecdote,† "believed, that he (lord Coke) found the name of his own wife on the first page."

Mrs Turner was the widow of a physician, and the poisons administered to Overbury were procured of Franklin and mixed by her. The first poison was of a green and yellow colour, what lord Coke calls roseacre, other writers, rosalgar, possibly realgar or orpiment, (the sulphuret of arsenic;) the second was white arsenic, and so on through seven different kinds of poison. Mrs Turner requested Franklin that they might be all slow poisons, "that would not kill a man presently, but lie in his body a certain time, wherewith he might languish by little and little," and she gave him four angels, with which he bought *aqua fortis*. She tried it upon a cat, which languished and cried pitifully two days and then died. For this reason she deemed *aqua fortis* too strong, and upon his saying arsenic was too violent also, she proposed powder of diamonds, and gave him money to buy some."

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* Institute, 50.

† Miss Aikin's reign of James I.

Mrs Turner was found guilty and sentenced to be hung. "Many women of fashion," says Miss Aikin, "as well as men, went in their coaches to Tyburn, to witness the death of this woman, who edified the spectators, it is said, with a very penitent end." But one would not sure be ugly though one's hung, and Mrs Turner "could not deny her vanity the slight gratification of making this, her last appearance, in a ruff stiffened with yellow starch,—a favourite fashion, imported by herself from France, but to which this exhibition of it proved immediately fatal."*

But it is more than time that we should direct our steps toward France, in this rapid and desultory excursion. On the 30th of June 1670, Henrietta Anne of England, duchess of Orleans, sister of king Charles II., grand-daughter of Henry IV., died at Paris. On the previous day, after drinking a glass of cold water, in her apartment at St Cloud, she was seized with a shivering, succeeded by a burning heat, which threw her into the most excruciating torments. She cried out, that she was poisoned. The physicians were sent for. When they saw her, they were struck with horror at her livid appearance, pronounced her beyond medical aid, and advised her to receive the last sacraments of the church without delay. The princess heard them pronounce her fate with firmness; and recollecting the manner in which Bossuet had attended her mother, the queen dowager of England, she desired that not an instant should be lost in sending for him. Three couriers were successively despatched to him, and he arrived between eleven and twelve o'clock at night, at St Cloud.

In the interval, the princess suffered the most dreadful pains, and her immediate dissolution being apprehended, she made a general confession of her sins to the Abbé Feuillet, a person generally esteemed, but of a harsh character. When her confession was finished, her attendants were called in. The whole scene was afflicting and horrible. The account which her confessor gives of his own conduct, makes us, perhaps unreasonably, blame his merciless austerity. Her lamentable shrieks, he treated as acts of rebellion against the divine will, and told her that her sins were not punished as they deserved. In the midst of her convulsions, she received his reproofs with mildness, but often inquired of Madame de la Fayette, who was at her bed-side, if Bossuet were not yet come. Before he came, she received the extreme unction from the Abbé Feuillet. Having exclaimed, in an agony of pain, "Will these torments never end?" "Do not forget yourself in this manner," said the merciless Abbé, "you ought to be better disposed for suffering; but I must tell you that your torments *will* soon end."

At length Bossuet arrived. As soon as the princess saw him, she made him promise not to quit her, till she breathed her last. He knelt down dissolved in tears, leaning on her bed, holding a crucifix in his hand. With a tremulous voice, interrupted by his own feelings, he invited her to join him, as far as her sufferings allowed, in the reflections, prayers, and acts of contrition, of faith, hope and charity, which he should address to God for her, and in her name. He was exceedingly moved, and every person present sympathized in the scene. Nothing could exceed the tender and affecting sentiments of devotion and piety, which Bossuet suggested to her. He finally subdued by them, in a great measure, her sense of the cruel sufferings which she endured. The princess heard him with mild and composed constancy. If he stopped for a moment, she gently entreated him to continue, assuring him that his words were of inestimable value to her. He then read over to her the recommendation of the soul in the liturgy, explained it to her; made her gently repeat with him its soothing prayers, softly instilled into her the sentiments, which they are intended to convey; filled her soul with faith, with compunction, with calm, with resignation; and above all, with divine love for him, into whose hands she was so soon to yield her soul. She herself, at last, felt a consciousness of her serene triumph over pain. "O, my God," she exclaimed, "why did I not always adhere to thee!" She recollected that the crucifix which Bossuet had in his hands, was the same which he had given to her mother, the queen dowager of England, to hold in her agony. She took it from him, and kept it in her hands till she breathed her last.

An hour before she died, she turned to Madame de la Fayette, and in the English language, which Bossuet did not understand, desired her to observe, that "full of gratitude for the spiritual assistance, which she had received from Bossuet, she requested that, after her decease, a particular emerald ring, set in diamonds of great price, might be presented to him." Her torments continued to the last, but her patience remained. She persisted in listening to the exhortations, repeating the prayers, and making the humble and fervent offering of herself to the divine will, which Bossuet suggested to her. Those who heard them, never forgot them. The Abbé Feuillet himself declared, that he had never heard any thing so admirable.

At three in the morning the princess died. The particulars of her death were immediately related by Madame de la Fayette, to Louis XIV. He sent for Bossuet, heard them again from him, and then, with his own hand, put the emerald ring, mentioned by the princess, on the prelate's finger, and desired him to wear it for the rest of his life, in remembrance of her. He added, that he could not better show his regard for the memory of his sister-in-law, than by desiring Bossuet to pronounce her funeral oration.

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* Mrs Turner's personal appearance seems to have been the reverse of what might have been expected. She was a delicate beauty. In a curious poetical essay, entitled Sir Thomas Overbury's ghost, in the third volume of the Harleian Miscellany, she is thus described:—

"It seemed, that she had been some gentle dame,
For, on each part of her fair body's frame,
Nature such delicacy did bestow,
That fairer object oft it doth not show.
Her crystal eye, beneath an ivory brow,
Did show what she at first had been, but now
The roses on her lovely cheeks were dead.
The earth's pale colour had all overspread
Her sometime lively look, and cruel death,
Coming untimely with his wintry breath,
Blasted the fruit, which, cherry-like in show,
Upon her dainty lips did whilom grow.
O, how the cruel cord did misbecome
Her comely neck! and yet by law's just doom
Had been her death; those locks, like golden thread,
That used in youth to enshrine her globe-like head,
Hung careless down, and that delightful limb,
Her snow-white nimble hand, that used to trim
Those tresses up, now spitefully did tear
And rend the same, nor did she now forbear
To beat that breast of more than lily white,
Which sometime was the lodge of sweet delight.
From those two springs, where joy did whilom dwell,
Grief's pearly drops upon her pale cheeks fell."

The princess, as we have seen, believed herself poisoned. The court and city had the same belief. The English ambassador,—all Europe was persuaded of it. One of her household named to Voltaire the person who administered the poison; and stated that it was diamond dust, strewed on strawberries with sugar. In Paris it was generally believed at the time, that she died in consequence of drinking a glass of water, poisoned with succory. But Voltaire thinks she died a natural death, and that the malice of mankind and the love of the marvellous alone, suggested the idea of poison. The powder of diamonds, he says, is no more poisonous than the powder of coral; no impalpable powder is mechanically poisonous. He might have added that diamond powder enough to have taken the place of sugar, on a plate of strawberries, was not a poison very easily to be obtained. As to the glass of water, Madame de la Fayette and another lady drank of it, without inconvenience. The princess had, for a long time, suffered by a diseased liver;—and this, in the opinion of Voltaire, was the cause of her death. Great weight is due to his opinion, and his arguments are not without force. On the other hand, are her own convictions, and that of her family and the public at the time; her sudden death, too sudden it would seem to be occasioned by an hepatic disease; and finally the express declaration of Louis XIV., who is asserted, on pretty credible authority, to have declared his knowledge of the fact.

The belief that she was poisoned, arising in the manner related above, was strengthened by the known existence of violent feuds in the court, connected with secret negotiations, and derived additional currency from a most extraordinary series of incidents that occurred at this time. It was precisely at this period, that the crime of poisoning, unknown to any extent in the civil wars of France, fruitful as they were in almost every other species of atrocity, made its appearance at Paris. Voltaire justly mentions it as an extraordinary fact, that as this base and terrific crime made its appearance in Rome in the most flourishing period of the republic, so it broke out in France in the proudest and most prosperous days of the monarchy.

Mary Margaret d'Aubray, daughter of the magistrate Dreux d'Aubray, was, in the year 1651, married to the marquis de Brinvilliers, son of Gobelin, president of the chamber of accounts. Brinvilliers had a fortune of thirty thousand livres a year, and his wife brought him two hundred thousand as a dowry. He was quarter-master of the regiment of Normandy, and in the course of his military services became acquainted with Godin de Sainte Croix, a young man of distinguished family, a captain of cavalry in the regiment of Trassy. This young officer, then a needy adventurer, ingratiated himself into the good opinion of the marquis de Brinvilliers, became a constant visiter at his house, and finally domesticated in his family. Not long after this took place the marquis died, without suspicion of foul play, but not till his large property had almost vanished under the extravagance and dissipation of his wife.

After his death, a discreditable intimacy between his widow and the young Sainte Croix arose; and her father, to arrest and punish the scandal, obtained a *lettre de cachet* for the commitment of Sainte Croix to the Bastile. It so happened, that at this time, two Italians, one of whom was named *Exili*, were confined in the Bastile as poisoners. They had commenced business in Paris, in conjunction with Glaser, a German apothecary, in search of the philosopher's stone. Failing in this, they took to vending secret poisons, by way of repairing by crime, what they had lost by folly. The confessional betrayed their guilty secret, and the two Italians were thrown into the Bastile. One of them died. The other, Exili, though not convicted, was retained in prison, and found the means, from the interior of the Bastile, of carrying on his nefarious practices.

Precisely at this period, Sainte Croix was committed to prison, and confined in the same apartment with *Exili*. Actuated by the most violent and lawless passions, the wicked arts of Exili furnished him prompt means of revenge and gratification. At the close of a year's imprisonment, they were both released, but Sainte Croix kept Exili with him, till he had made himself master of his art. As soon as he had acquired it himself, he taught it to the marchioness de Brinvilliers, who assumed the character of one of the sisters of charity, distributed food to the poor and nursed the sick in the hospitals, in order that she might have an opportunity of trying the strength of her poisonous preparations, on the unhappy wretches who came under her care. This is asserted by Pitaval, in the trial of Brinvilliers in the *Causes Celebres*, and was believed by the public at the time. Voltaire denies it, but only, according to Beckmann, for the pleasure of differing from Pitaval, (*avocat sans cause*, as Voltaire calls him,) and it is admitted by Voltaire that Brinvilliers and Sainte Croix were connected with persons, who were charged with this fiendish practice.

Possessed of this frightful instrument of malice, Brinvilliers now disclosed a demoniac temper, such as perhaps no mortal ever exhibited. She bribed La Chausée the servant of Sainte Croix, to poison the magistrate d'Aubray her father, and her brother a counsellor of parliament, who lived at home. Her father took the poison ten times, and her brother five, before they sunk under it. An attempt was then made on her sister; but suspicion was awakened; her sister was on her guard, and escaped. The guilty couple proceeded so cautiously, that the suspicions did not fall on them.

An accident betrayed the horrid mystery. Sainte Croix, when engaged in preparing the poison, was accustomed to wear a glass mask. It happened, on some occasion, to drop off while he was thus engaged, and he was found asphixiated in his laboratory. This account, we must own, sounds suspicious. The object of the mask must have been to prevent his inhaling the fumes of the poisonous drugs which he compounded; but how could he live without breathing? We could almost believe, that his fair friend found it at last convenient to close their relations by this summary process. Be this as it will, on searching his effects, a small box was found, addressed in the handwriting of Sainte Croix to the marchioness, with an earnest request in writing, addressed to those into whose hands the box might fall, after his death, that it might be conveyed to her, or if she were not living, that it might be burned. This box was opened, and was found to contain a number of preparations of poison, of different kinds, with labels indicating their quality. When the knowledge of these incidents reached the marchioness, she endeavoured, by bribing the officers of justice, to get possession of this casket; and failing in the attempt, she fled the kingdom. The servant above alluded to, La Chausée, was imprudent enough to remain in Paris, and falling under suspicion, was arrested, brought to trial, and finally to the confession of several murders, not before suspected. He was broken alive on the wheel in 1673.

The marchioness sought an asylum in a convent at Liege. A very active officer, named Desgrais, was despatched to apprehend her. Unable, without her consent, to remove her from her privileged place of asylum, he put on the dress of an abbe, found means to make her acquaintance, assumed the character of a lover, enticed her in this way to accompany him on a party of pleasure, and arrested her. What a love-suit, a bailiff and a poisoner! Among her effects seized at the convent was a full confession of her crimes, written out in her own hand. She therein admitted, that she had set fire to houses; and that she had by poisoning occasioned the death of more persons than any one suspected. She was brought to Paris, tried, convicted, and confessed her enormities. She even made a show of penitence, and went with great firmness to the place of execution, on the 16th of July, 1676. Beholding the great crowd assembled to see her die, she cried out, in a contemptuous manner, "You have come to see a fine spectacle!" She had flattered herself, on account of her respectable connections, with the hope of a pardon. When undeceived in this respect, she said "*C'est donc tout de bon*," "They are in earnest, it seems," and submitted to her fate. She was beheaded and afterwards burned.

And what imagination have our readers formed of the appearance of such a demon as we have described? Do they suppose she had a deep-set fiery eye, blazing from its socket, with the flames of fiendish passion that consumed her, an aquiline nose, sunken cheeks, thin lips, inflexible and merciless, and a sallow complexion? She was like Anne Turner, uncommonly fair; her features were extremely regular, her face round, full, and beautiful, and she wore a serene look, a tranquillity of air, which seemed to breathe of goodness. So much, cries the bewildered Pitaval, for *metoposcopy!*

But her execution did not put a stop to the horrible practice of secret poisoning. Mysterious deaths were of frequent occurrence, and the archbishop of Paris was informed, from different parts of his diocess, that the crime of poisoning was still confessed, both in high and low families. The number and consideration of the persons suspected was so great, that it was deemed expedient to institute, at the Bastile, a tribunal to detect and punish them. This court was established in 1679, under the name of *Chambre de Poison* or *Chambre ardente*. Two women, La Vigoreux and La Voisin, a priest named Le Sage, and some others were first arrested, for carrying on a traffic in poisons. They pretended to necromancy and raising the spirits of the departed, and furnished love potions and philtres to those who desired them. Many persons, probably without criminal intentions, urged by curiosity or superstition, resorted to these wretched impostors. La Voisin kept a list of all her dupes, on the authority of which they were arrested and brought to private trial, before the burning chamber. Some of the first personages of the kingdom were thus implicated;—among them two nieces of the cardinal Mazarin, the duchess of Bouillon, the countess of Soissons, (mother of prince Eugene), and the marshal Luxembourg. Nothing was proved against the duchess of Bouillon, but that she had resorted to Le Sage, in his capacity of sorcerer. He pretended to foretell the future, and to afford those who consulted him, the gratification of beholding his satanic majesty. La Reynie, one of the judges of the burning chamber, was indiscreet enough to ask the duchess if she had ever seen the devil. She replied, that she saw him at that very moment, that he was very ugly and very hideous, and appeared before her in the guise of a counsellor. The prudent magistrate drew off from the interrogation.

A more serious charge was brought against the countess de Soissons and the marshal de Luxembourg. Le Sage, La Voisin and La Vigoreux unquestionably dealt in secret poisons, and particularly in a powder, which had got the name of *succession powder*—from the real or supposed frequency with which it was used to hasten or change the succession, in the families of the rich! The names of all who resorted to them, had been reported to the government, with the charge of purchasing poison. The king intimated to Madame de Soissons, that, if she was guilty, she had better escape by flight. She replied that she was innocent, but could not endure the scandal of a public trial. She repaired to Brussels and died in 1708, about the time that her son, the prince Eugene, by his humiliating victories over Louis XIV., sufficiently avenged his mother for whatever injustice the king had allowed to be done her,—of which, by the way, we do not think she had many to complain of. Great ladies, who go to professed poisoners, to see them raise the devil, must expect some little trouble.

Voltaire states, with great circumstance, that Francis Henry de Montmorency-Boutteville, duke, peer, and marshal of France, who united the great name of Montmorency to that of the imperial house of Luxembourg, already renowned as a great captain in Europe, was denounced to the burning chamber. The foundation of the charge was the following. The marshal wished to recover some lost papers of value. Bonard, one of his people, applied to Le Sage, to know where they were to be found. Bonard's first conjurations were unsuccessful. In despair, he applied to his master, the marshal Luxembourg, for a sort of power of attorney, to do all things necessary to recover the papers; and in this instrument, between the body of the paper and the signature, were two lines, in a different hand-writing, by which the marshal gave himself to the devil. Thus far the charge would have worn the aspect of ridicule; and at the worst, would have seemed a piece of indiscreet trifling, on the part of the marshal. But the wretches, with whom Bonard dealt, on behalf of the marshal and in virtue of his power of attorney, did not, like some others, confine themselves to the settlings of a tea-cup. Le Sage swore that the marshal had applied to him to poison a female, who had the papers in her hands, and who refused to give them up; and his accomplices testified, that they had accordingly poisoned her, cut her body in pieces, and thrown it into the river; and all this at the instigation of the marshal.

Such were the charges against him. He surrendered himself voluntarily to imprisonment. He was confined, by order of Louvois, the minister, who was his enemy, in a dungeon six feet and a half long, where he fell sick. He remained five weeks without being brought to trial. He was finally confronted with Le Sage and one of his confederates, and it appeared and was admitted, that he had once resorted to Le Sage to have his horoscope cast.

Among the crimes with which he was charged by Le Sage, was that of having entered into covenant with the devil, to procure a marriage between his son and the daughter of the marquis de Louvois. In reply to this imputation, he simply said, "When my ancestor, Matthew de Montmorency, married the widow of Louis le Gros, he did not consult the devil, but the states general of France, which declared, that in order to secure to the king, in his minority, the support of the Montmorencys, the marriage was expedient."

The trial of the marshal was prolonged fourteen months, and he was finally released, without being condemned or acquitted. La Voisin, La Vigoreux, her brother, a priest of the same name, and Le Sage, were burned alive at Paris. The marshal de Luxembourg retired for a few days into the country, and then returned to court, to resume his functions, as captain of the guards. He did not see the minister Louvois, nor did the king say a word to him on the subject. He replied to all the charges of all his enemies, by the brilliant achievements of his subsequent campaigns.

Is there no way of bringing these strange incidents within the operation of the common laws of human nature? Undoubtedly. A belief in fortune-telling and divination was universal at this period. The traffic in poisons had accidentally established itself at Paris, at this juncture, and the two trades, by no very violent association, happened to be united in the same hands. The *burning chamber* was a political machine, by means of which Louvois and Madame de Montespan brought the whole court within their grasp, under a charge of sorcery and poisoning. They had got possession of a few wretches, who were unquestionably guilty, and who, from pure malice or the hope of purchasing their own pardon, accused any body, that was odious to the minister or the mistress, and swore to anything that was desired.

The poisoners were executed. Those against whom nothing but divination was alleged were released, the burning chamber was broken up, after about eighteen months' jurisdiction, and poisoning, as an organized business, passed away.

The time would fail us to go much further into particular anecdotes. The duchess of Portsmouth never ceased to charge James II. with poisoning his brother king Charles; and Maria Louisa, daughter of Louis XIV., and Infanta of Spain, was believed to be poisoned, eating an eel pie. The celebrated duke of Orleans, afterwards regent, was so vehemently suspected of poisoning the duke of Burgundy and his son, who stood between him and the throne, that he was driven in his grief and desperation, to demand a judicial inquiry. The clamour was such, that no one (says Voltaire) who had not witnessed, could believe it. The marquis de Camillac found the duke stretched on the ground, bathed in tears, and driven to despair. The warrant for his arrest was actually made out and signed by the king, but suppressed at his mother's intercession.

Is there no moral conveyed by these sketches? Unquestionably there is. We regard with horror these acts of secret or daring atrocity, we congratulate ourselves that we live in an age, when the poisoner is a rare and solitary criminal. But is not he who maliciously circulates a calumny, the poisoner of his neighbour's good name? Is not he who, for the sake of gain, employs himself in dispensing a maddening liquor to the easily tempted, a poisoner of health and morals? Locusta and Toffana poisoned the body. Is not he who pours into his brother's heart the venom of a bad example the poisoner of the undying soul?

POISSON, M., President of the Academie de Sciences, a peer of France, and a foreign member of the royal society of London, was born in 1782; and his whole life may be said to have been consecrated to the promotion of analytical discovery and scientific investigation. The principal work by which his name became spread over Europe was his "Traité de Mécanique Rationelle;" a work in which the deepest powers of analytical calculation are made subservient to the enunciation and demonstration of the various branches of the subject; and which has since become the text book, the *magnum opus*, for all who enter into the subject of mechanics at all profoundly. Among the other works of M. Poisson may be mentioned his "Researches on Planetary Perturbations;" "On the Oscillations of Fluids;" "On the Movement of Elastic Fluids in Cylindrical Tubes;" "The Theory of Wind Instruments;" "The Treatise on Heat, and on the Distribution of Heat;" as also his "Essay on the Doctrine of Chances." In 1825, M. Poisson published his method of comparing the magnetic condition of the earth anterior to its condition as now existing, in which he entered into the inquiry as to whether the action of the earth on the magnetic needle had increased or decreased. Besides these works, M. Poisson published several minor essays on the vibrations of sonorous bodies, the propagation of motion in elastic fluids, &c. M. Poisson was long one of the Examiners of admission at the Ecole Polytechnique, and at the time of his death, which took place on the 25th April, 1840, was president of the academy of sciences, and a peer of France. He was elected a foreign member of the royal society of London in 1818. For some years before his death, he resided at Sceaux, about five miles south of Paris. His funeral was conducted on a scale of unusual ceremony, and was especially remarkable as being attended by all the savans of Paris.

POND, John, an eminent practical astronomer, who for a period of nearly twenty-five years filled the high and important office of Astronomer Royal; died at Greenwich on the 7th Sept. 1836. His perception of the capabilities of instruments generally, and of the mode of so using them as to render all their strong points available and their weak ones unprejudicial, formed a very striking feature in his professional character. The numerous bulky folio volumes of his observations, so highly appreciated by scientific men in every part of the globe, are alone sufficient to show the extent and utility of the work performed at Greenwich during the time that the establishment was under his direction. The accuracy of a portion of those observations is to be attributed to improvements in the mural circle, suggested by Mr Pond, which converted it into the most perfect instrument used in the observatory; but the correctness of the chief part must be ascribed to a mode of observing of which he was the sole inventor. This consisted in the union of the two circles, and the observing with one by direct vision, with the other simultaneously by reflection; thus correcting those errors which are incidental to observations made by a single instrument. A result, and, perhaps, the most important, of the application of the mural circle, has been the formation of a catalogue of the fixed stars more perfect than any before or since produced. Here it may also be stated that the vast superiority of the Greenwich transit observations made by him has been publicly recognised by several contemporary astronomers of the first rank. To his earnest and reiterated solicitations our national observatory is indebted for many of the new instruments which have, confessedly, rendered it so pre-eminent and complete. His skill in the use of these was very remarkable; his talent for observing quite unique; and it is a question whether any of even the most skilful of his countrymen are thoroughly, or at least practically, acquainted with his mode of operation: but MM. Arago, Biot, and Delambre, as well as MM. Bessel and Schamacher, the great French and German astronomers, have borne witness to the decided merit and originality of his method.

Mr Pond contributed many scientific articles to "Rees' Cyclopædia," and wrote the introduction to astronomy prefixed to "Pinkerton's Geography" but, by nature a retiring man, he unwillingly appeared in print, and when called upon to take up his pen, was as brief as the nature of his subject would allow; though neatness and perspicuity characterise whatever he produced. Speaking of his communications to the royal society, Sir Humphry Davy, in a discourse delivered in 1828, on presenting him with the Copley medal, awarded to him by the council of that learned body, "for his various papers on astronomical subjects, expresses himself in the following language:—"The merits of Mr Pond, as an indefatigable scientific observer, are fully and justly estimated by all the fellows of this society who have visited or taken any interest in the royal observatory; but, perhaps, the early devotion of the astronomer royal to his favourite science, the enthusiasm with which he pursued it, and the sacrifices of time, health and money that he made in consequence, may be less generally known. Twenty-five years ago, Mr Pond, animated by his love of astronomy, carried, at a considerable expense, some valuable instruments to the coasts of the Mediterranean, hoping that a purer atmosphere and a brighter sky would give him advantages in pursuing continued observations on the fixed stars not to be obtained in the variable climate of this island; and he passed some time devoted to his scientific objects, at Lisbon, Malta, and Alexandria; but the state of his health obliged him to return, and he established himself at Westbury, in Somersetshire, where, in 1800, I had the pleasure of visiting him, and when I was delighted to witness the ardour with which he pursued his inquiries, and saw with admiration the delicacy of his observations with the astronomical circle of Mr Troughton's construction. The researches made by Mr Pond in the declinations of some of the fixed stars in 1800, and published in the 'Philosophical Transactions' for 1806, fixed the attention of astronomers by their accuracy and clearness of detail, and, probably, principally caused those scientific recommendations which inclined our august patron, the prince regent, to appoint him to the distinguished office he now holds."

Mr Pond's appointment as astronomer royal arose out of his having, while residing in the country, and but little known, communicated to Dr Maskelyne—who was a stranger to him—several corrections of errors in the Greenwich Observations, and in the Nautical Almanac. These induced the latter within a very few months of his decease, to mention him to the council of the royal society, as the fittest man to succeed him. An opinion from such a quarter necessarily had great weight; and having been strongly supported by Dr Wollaston, Mr Pond was, on the death of Dr Maskelyne, in 1810, appointed to the vacant office, on the recommendation of Sir Joseph Banks, to whose discernment and impartiality the government of that period very wisely entrusted its scientific patronage. The salary annexed to the situation of astronomer royal had been suffered to remain miserably low—the great importance and responsibility of the office being considered—for to Dr Maskelyne, a man of large fortune, an increase was no object, therefore, never asked; but it received some augmentation on the appointment of his successor; though the services required, which so very few are qualified to perform, were never liberally or even justly, remunerated, till provision was made for the purpose, on Mr Airy's acceptance of the office.

PONTEFRACT or **POMFRET**, a town in the West Riding of Yorkshire, 178 miles from London. It consists of three principal streets, nearly parallel, which are intersected by smaller ones. The streets are spacious and the houses well-built. The trade of the town is inconsiderable, but the place is noted for its extensive nursery grounds, its large plantations of liquorice, from the juice of which the medicine called Pomfret-cakes is made, and its great horse fairs. The old castle of Pontefract, some of the ruins of which still remain, occupied a large site upon an elevated rock, and was the scene of several historical events. It was defended during the civil wars by the partizans of Charles I., but ultimately taken, and soon after demolished. Pontefract is now governed by a mayor, a recorder, four aldermen, and twelve councillors, and it returns two members to parliament. Population of the borough in 1841, 4669; of the parish, which includes five other townships, 10,688.

POSTS. (*a.*) The first great reform in the Post Office establishment in this country took place in 1784, when Mr Palmer's celebrated plan of conveying letters by mail coaches was introduced. Before that period, letter-bags were entrusted to boys who were ill-paid, and frequently of very doubtful characters. They travelled upon miserable horses, and were equally unable to defend themselves from the attacks of robbers, or to escape by flight. In fact, the waylaying of these boys for the purpose of robbery was at that time an affair of constant occurrence, and often not without suspicion of collusion on the part of the carriers. The principal feature in the improvement suggested by Mr Palmer was the discontinuance of this horse-post, and the employment of coaches, which, in consideration of their liability to attack from robbers, should each be provided with an armed man to guard them. It formed a part of the proposed improvement that the times of departure of the coaches bearing mails from places in the country should be so regulated as to insure their nearly simultaneous arrival in London at an early hour of the morning, and that the whole should quit the metropolis at the same hour in the evening. The first mail coach upon Mr Palmer's plan left London for Bristol, on the evening of the 2nd of August, 1784.

The difficulties which the projector had to encounter in carrying his proposed improvements into effect might form an instructive chapter in the history of inventions. At the time the management of the post-office attracted Mr Palmer's attention, he was the manager of the theatres of Bath and Bristol, and in the enjoyment of a considerable income. The first circumstance that particularly struck him was the great length of time consumed in the transmission of a letter from London to Bath, a distance of 110 miles. A letter posted in London on Monday evening was seldom delivered earlier than Wednesday afternoon, frequently much later, whilst at the very same time coaches were leaving London on Monday afternoon and reaching Bath by breakfast time the following morning.[*] The postage of a letter was 6d., the carriage of a parcel 2s., yet Mr Palmer discovered that the tradesmen continually made parcels of their letters, the extra speed being of more consequence than the extra expense. From this individual specimen of the existing arrangements, Mr Palmer carried his inquiries farther: he found that the post-office was as irregular as it was slow; that its robbery was a matter of continual occurrence; that the grossest mismanagement, and the most flagrant abuses, pervaded every department; and, in short, that a thorough reformation was required, both for the sake of the public accommodation, and the government revenue. He immediately devoted himself to the consideration of the remedy, and presented the first rude sketch of his plan to Mr Pitt, the minister, in 1782, with an intimation that he was willing to devote his entire time and attention to the carrying it into operation; that if he failed, he should not expect a shilling for his services, but that, if he succeeded, he expected 2½ per cent. upon the increase on the net revenue. His proposal pleased the sagacious premier, who returned it to him in order that it might be further developed, stating at the same time that the pecuniary proposition was fair, and would not be objected to. Early in 1783 the plan, prepared as desired, was again presented and about to be acted upon, when the administration was dissolved. The new ministers, however, took up the matter, but for the time did no more than transmit the plan to the post-office for the opinion of the authorities. In the interim Mr Palmer travelled through the country to clear up fresh doubts that had been expressed, and from this period appears to have determined to pursue the affair at every personal risk, satisfied that success was feasible, and that a magnificent fortune would ultimately be his reward for all the difficulty, anxiety, and pecuniary danger he had to undergo. In July following, the post-office authorities furnished their opinions in the shape of three volumes of objections! declaring generally that the plan was impracticable, and would be prejudicial to revenue and to commerce. Some of the objections offered show the extreme absurdities into which selfishness or bigotry may lead men, even upon matters with which above all others they ought to be the best acquainted. One declared that the coaches went too fast for the proper transaction of the business of the post-office in the different towns, whilst another could not even see why the post-office *should* be the swiftest conveyance in England. It was asserted that the time for the transmittal of the mails from London, namely, from midnight until two or three o'clock in the morning, could not be altered without throwing the whole correspondence of England into confusion. As to the appointment of a guard, one gentleman observed pleasantly as well as shrewdly, that "he might be waited for at every ale house he should pass by," whilst another could not "think a guard to each mail would add to its safety;" but the climax of the argument was reached by a third, who, evidently thinking there was danger in too much security, lest the robbers should grow outrageous at such unfair conduct, observed, "that when desperate fellows had once determined upon a mail robbery, the consequence would be murder in case of resistance!" In conclusion, it was stated generally with respect to the affairs of the post-office, "that the constant eye that has long been kept toward their improvement in all situations, and under all circumstances, has made them now almost as perfect as they can be without exhausting the revenue arising therefrom." Seeing all this, we may excuse the merriment apparently produced among these gentlemen at the absurdity of Mr Palmer's idea, that the Bath mail could be brought to London in sixteen or eighteen hours. At all events, whether the plan was or was not practicable, there was no denying the firmness of its author. Instead of listening with humble conviction to the objections urged, he refuted them all, and decided government in his favour. Again delay was caused by a change of administration, but it was Mr Pitt who came into power, and who lost no time in visiting the post-office with Mr Palmer to make the necessary arrangements. Fresh objections were here presented to the minister, the authorities were more than ever convinced that the scheme was impracticable and destructive. Nearly seven more anxious months were spent by Mr Palmer in collecting information to overcome these new obstacles: at last a meeting took place, at which the postmasters-general and their principal officers were confronted with Mr Palmer, who triumphantly answered all their objections; a trial was peremptorily ordered to be made. On the 2nd of August, 1784, the first mail coach left London for Bristol, and others to different parts followed, and, before many days had elapsed, it became evident to every unprejudiced person that the plan would be greatly successful. By the autumn of the same year, that is within twelve months of the commencement of the plan, it had been carried into execution with complete success on the principal and direct cross roads. Mr Palmer now asked for his reward; he applied for the legal instruments of the appointment which had been promised to him, and received a draft thereof, by which he was declared surveyor and comptroller-general of the post-office during life, with full authority to suspend any officers for neglect of his own or the postmaster-general's instructions. His salary was fixed at £1500 a year, with a commission of 2½ per cent. upon the surplus of the net revenue beyond £240,000. This appointment was delayed upon different pretexts from time to time, and was ultimately done away with altogether, and an annuity, large in itself, but which was infinitely below the amount Mr Palmer was entitled to, settled upon him in professed compensation.

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[*] The slow rate of travelling here mentioned was by no means peculiar to the Bath mail. The post of Monday night from London reached Norwich, Worcester, or Birmingham, only on Wednesday morning, and did not arrive at Exeter until Thursday morning at nine o'clock. Dr Cleland, in his "Statistical Account of Glasgow," tells us that before the introduction of mail coaches into that part of the kingdom in 1788, the course of post from London to Glasgow was five days, the letters being then carried round by Edinburgh. This writer mentions a curious circumstance, which shows how slowly improvement was allowed to proceed in those days. Only five London mails had usually arrived in Glasgow during the week, it not being customary to receive or despatch letters at or from Edinburgh on Sunday; but when the mail-coach conveyance had been brought under Mr Palmer's improvements as far as Carlisle, it occurred to the managers of the post-office that the sixth mail for Glasgow, which the Sunday regulation of the Edinburgh office prevented being passed through that medium, might be conveyed by the mail-coach to Carlisle, and forwarded thence to Glasgow. By this means the sixth mail reached Glasgow in four days, while the conveyance of the other five continued, for a year beyond this time, to occupy five days. It appears to have required the whole of that time in order to discover that the five mails, which required five days to reach Glasgow by Edinburgh, might, like the sixth, be carried by Carlisle in four days.

The beneficial effects of Mr Palmer's arrangements were soon felt. For the nine years ending 1783 (prior to the commencement of the new system), the net amount of revenue from the post-office was only £149,333 18s. In 1793, the net revenue was £391,508; and in 1797, it was £541,833! The facilities afforded for the speedier transmission of correspondence were no less remarkable: generally speaking, the mails were conveyed in one-half of their previous time; in many cases, in one-third of their previous time; and in some of the cross posts, in one-fourth! Posts were made daily to above 500 places, which had before only received them thrice a week! Lastly, the delivery of letters became as conspicuous for its regularity and adaptation to the public convenience, as it had been previously notorious for the opposite qualities. The safety enjoyed by correspondents contrasts in an equally extraordinary manner with the previous insecurity. Robberies had been of continual occurrence, and the mere cost of the pursuit and apprehension of the offenders amounted in a single year to several thousand pounds. There is no mystery as to the cause of so wretched a state of things. Mr Palmer states, in the plan presented to Mr Pitt, that "the mail is generally intrusted to some idle boy without character, mounted on a worn-out hack, and who, so far from being able to defend himself, or escape from a robber, is much more likely to be in league with him." Mr Palmer did indeed "reform this altogether," for up to 1797 not a single robbery of his mails had taken place, and therefore not a shilling had been lost by the public or expended by the post-office in this way. Most important alterations were made in the domestic management of the post-office. Many gross abuses and equally gross frauds were checked or destroyed for ever; the health and comfort of the clerks were incalculably improved by the abolition of so much midnight employment; and, generally, the entire system was simplified and improved. Lastly, whilst the revenue had increased as we have seen, the number of newspapers carried free had increased from 2,000,000 to 8,000,000.

One part of Mr Palmer's plan had been to raise the rates of postage. This was probably proposed as much with the idea of recommending the scheme to the ministers as from any other motive. The rates were in consequence raised in 1784 to 2d. for the letters which had been previously 1d., 3d. for those which had been 2d., and so on generally through the scale. A suggestion of Mr Palmer's as to remedying the abuses of franking was adopted: it was made imperative that members should write the name of the place where they then were, and the date, in words at full, and that the letter should be posted only as a frank in the post-office of such place and on the day thereon named. In the same year the Irish post-office was established independent of that of England, but the two have been now for several years consolidated. In 1795 the abuses of franking again attracted the attention of the legislature; franked letters were now only to carry one ounce, and they were only to pass free when posted within twenty miles of the place where the members concerned were on that or the preceding day. No more than ten also were to be sent or fifteen received daily. Soldiers and sailors were allowed by this act to send letters countersigned by their officers on payment of 1d., and patterns, with covers open at the ends, and containing no writing but the prices, and the name and address of the sender, were to be charged only single postage. Two years after, by the 37th Act of George III., the rates of postage were again raised, an additional 1d. being levied upon the lower priced classes of letters, 2d. on the higher. In 1799 the postmaster was empowered to send foreign letters by any vessels; to charge 4d. upon ship letters received, for which the shipowner was to be allowed 2d. In 1801 the rates of the higher priced classes of letters were considerably increased: 8d. had been hitherto the maximum, even for distances of 500 miles; the maximum was now made 1s. Soon after this, some inconveniences or losses appear to have been incurred by postmasters giving back letters to the professed writers; this was to be done no longer, on any pretence. Members of parliament were authorised at this period to send or receive letters, printed votes, proceedings in parliament, and printed newspapers free, and the postage on such votes and newspapers was reduced to 1d. to the public. The former part of this enactment was probably to legalise a privilege then existing—not to create a new one. It should seem that government thought the continual increase of the net revenue was owing to the continual increase of the rates of postage, rather than, as was most probably the truth, in spite of them; so it went on levying addition charges every few years, till its rapacity defeated itself. In 1805 an additional 1d. was charged upon all classes of letters; and again, in 1812, on all but the two or three lowest priced classes. The following table, illustrative of the progressive increase in the rates of postage from 1765 to 1812, applies strictly to England and Wales only, but shows also with sufficient accuracy the progress of the different rates of postage for Ireland and Scotland:—

	1765	1784	1797	1801	1805	1812
	d.	*d.*	*d.*	*d.*	*d.*	*d.*
Not exceeding 15 miles .	1	2	3	3	4	4
Above 20 & not exceeding 30 miles	2	3	4	4	5	6
— 50 — 80 —	3	4	5	6	7	8
— 170 — 230 —	4	6	8	9	10	11
— 400 — 500 —	4	6	8	12	13	14

In 1816 the gross revenue amounted to £2,418,741, the charges of collection of which amounted to £704,639, leaving a net revenue of £1,619,196 since which time no increase has taken place. By the 6th of George IV. the postage of 1d. on votes, proceedings in parliament, and newspapers, was virtually done away with by the repeal of the regulation requiring that a member's name should be written on the covers. In 1837 the entire body of acts relating to the post-office were repealed, and their chief provisions consolidated into one general statute, 1st of Victoria.

Early in the year 1837 a pamphlet was published by Mr Rowland Hill, developing a plan of a uniform postage, at the rate of one penny per half ounce. The pamphlet commenced with a view of the state of the post-office revenue, and showed that the cause of its stationary condition was the enormous rate of taxation charged upon letters, which was proved to be several hundred per cent. The great extent and universal prevalence of the custom of sending letters by private carriers and by parcels was also shown to be the natural result of the same heavy rates of postage, and that a very low charge, by including all these, would tend in a great measure to make up the loss to the revenue from such low charge being made general. Attention was also called to the certain increase of correspondence, commercial, literary, and domestic, that must result, if the postage were thus reduced. Lastly, the almost incredible fact was stated, that the cost of transit for a letter from London to Edinburgh was only the 36th part of a penny, consequently that there was no coin small enough to denote the difference that should be made between letters transmitted the longest and shortest distances. From all this was deduced the conclusion that 1d. should be the general charge for letters throughout the country. The statements and propositions were illustrated by a great amount of various and interesting information, and by details evidently well calculated for the safe and effectual operation of the plan. The public were at first surprised: some small portion of it, perhaps, thought the scheme simply ridiculous; another, that it was practicable and excellent; but the larger proportion looked upon the idea as too good to be true. Three editions of Mr Hill's pamphlet were called for in the space of a few months; objections were made, but so successfully answered that they forwarded rather than retarded the measure; public bodies began to petition; the press gave its cordial assistance; a committee of the House of Commons was appointed, and the report was highly favourable, though it did not venture to recommend for the time more than a partial adoption of the scheme. Government accordingly prepared to make a partial trial, but by this time the nation had become thoroughly satisfied of its entire excellence and practicability, and the Houses of Parliament and the government were at last fairly petitioned into its complete adoption.

Previous, however, to the entire reduction of the rate of postage to a uniform penny charge, an intermediate measure was brought into operation, by which all single postage rates between places in the United Kingdom which exceeded 4d. should be reduced to that sum: inferior rates to remain undisturbed. This rule continued in practice only from the 5th December, 1839, to the 10th of January, 1840, when the uniform penny postage commenced. On the 6th of May in the same year, the postage stamps, consisting of a profile of the queen on adhesive pieces of paper, and postage envelopes, came into use.

POTATO, (*a.*)* In the beginning of the sixteenth century, the *Spanish sweet potato*, a species of Convolvulus, was common in gardens over Europe. It was first introduced into Spain from the West Indies, and bore the Indian name of Battata. There is also a possibility of its having come to Europe from the east, as it is a native both of India and China. These sweet potatoes were long used in England as a delicacy, and were imported, in considerable quantities, from Spain and the Canary islands, being supposed to have the peculiar property of restoring decayed vigour in men. The famous *kissing comfits*, so much in vogue in Shakspeare's day, and with which our ancestors were imposed upon, as we are by universal pills, and other modern omnipotent remedies, were made principally of these and eringo roots. Falstaff says in the Merry Wives of Windsor,

> "Let it rain potatoes and hail kissing comfits."

The Battata grows abundantly in Jamaica, Barbadoes, and the other West India islands, and it is propagated, not like our potato, but by slips. The pounded or grated roots make excellent puddings and cakes; and, when mashed and fermented, a cooling and refreshing drink is made from them, called *Mobby*, somewhat resembling small-beer.

The potato now in use, the *Solanum tuberosum* of botanists, according to the Spanish historians, was found in cultivation on the first arrival of the Spaniards in Chili and Peru. Peter Cieca informs us, in his Chronicle, published in 1553, that the inhabitants of Quito, and its vicinity, have, besides maize, a tuberous root which they eat, and call Papas. Molina, in his Natural History of Chili, vol. ii., quotes the authority of several ancient writers to prove that the plant is indigenous there. He describes two species or varieties, the one wild, and with small bitter roots, the other the one under cultivation; but appears to consider both to have been the same originally,—cultivation rendering the wild plant sweet and succulent, exactly as in the case of our carrot. The Spaniards having introduced these roots into their own country, did not retain their Peruvian name, but, from their similarity in nature to the sweet potato already in use, called them also Battatas. From Spain they were carried into Italy, where they were known by the same name as *truffles*, *taratoufli*. The first European writer (after those alluded to), who takes any notice of them, is the famous German botanist Clusius, who mentions having received two roots, in the year 1588, while residing at Vienna, from the governor of Mons, in the province of Hainault; who, it seems, had himself procured them from the attendant of the pope's legate, under the name of *Taratoufli*. He gives a plate of it among his rare plants. So much for its introduction on the continent of Europe.

In the year 1584, Sir Walter Raleigh, under the authority of a patent granted by queen Elizabeth, for discovering and planting new countries not possessed by Christians, sent out a number of colonists to Virginia. Now, although no absolute proof can be brought forward on the subject, yet, from concurring circumstances, and from tradition, it appears highly probable that the potato now in use amongst us was first brought to Ireland, either by Sir Walter himself, on his return from his voyage, or was afterwards sent to him by the governor of Virginia. The general opinion is, that he had them planted in his own garden near Youghal, in the county Cork. He is said to have given them to his gardener as a fine fruit from America, and ordered them to be put down in his kitchen garden. In August the plants flowered, and in September they produced their apples; but these were so totally different from what the gardener had expected to see, that, in a fit of ill humour, he pulled them and carried them to his master; asking him, "were these the fine American fruit." Sir Walter either really was, or pretended to be ignorant of the matter; and, having tasted them, told the man to dig up the *weeds* and throw them away. The gardener did so, but was astonished to find about a bushel of tuberous roots. Trial soon showed that this was the eatable part of the plant. The only written proof we have of the introduction of the potato by Raleigh, is found in the manuscript minutes of the royal society of London, December 13, 1693, when we are told the president, Sir Robert Southwell, informed the fellows that his grandfather first cultivated potatoes in Ireland, and that he got them from Sir Walter Raleigh. They were cultivated a long time in Ireland before they were known in England, and they were only at last introduced there by the shipwreck of a vessel containing some of them, on the coast of Lancashire, at a place called North Meols, which is still famous for their cultivation.

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* Abridged from an article by Mr Robert S. M'Adam, read before the Belfast Natural History Society.

We have thus seen the same plant brought from South America by the Spaniards, and from North America by the English. Now, it is remarkable, that, at the conquest of Mexico, in the reign of Montezuma, the potato was quite unknown in that country. How is it, then, that a plant belonging originally to the southern hemisphere should be found at the foot of the Alleghany Mountains, while it was unknown in the intermediate country, Mexico? Humboldt is the person who agitates this question. He proves satisfactorily that the potato is not indigenous in Peru, nor found wild in any part of the Andes situated under the tropics; no where, in fact, but in Chili, from which place we may conjecture it to have been propagated northwards under the government of the incas. Again, he proves the improbability of the potato having been brought to North America by any of the Peruvian tribes, both from physical and moral causes; and, combining this with the above mentioned singular fact respecting Mexico, starts a new idea, that the English colonists of Virginia themselves procured the plant from the Spanish settlements. "The colony," he remarks, "was in existence from July 1584. Now, the navigators of those times were not in the habit of steering straight westwards to reach the coast of America; they were still in the practice of following the track indicated by Columbus, and profiting by the trade-winds of the torrid zone. This passage facilitated communication with the West India islands, which were then the centre of Spanish commerce. It appears, then, natural enough that the English themselves brought potatoes from South America into Virginia. At the time when they came from Virginia to England, they were common both in Spain and Italy. We are not then to be astonished, that a production, which had passed from one continent to another, could in America pass from the Spanish to the English colonies."

From all these different considerations, we are almost warranted in concluding that Chili alone is the native country of the potato.

The potato was considered a great delicacy in the reign of James I. In the year 1619 we find it mentioned as one of the articles provided for the use of the queen's household. The quantity procured was very small, and the price two shillings a-pound. In the following reign, and during the continuance of the commonwealth, the potato remained equally scarce. Its cultivation, meantime, spread slowly over Ireland, and still more slowly in Lancashire. The first time that it was brought before the public as an object of national importance, was at a meeting of the royal society held in March 1663, when a letter was read from Mr Buckland, a gentleman of Somersetshire, strongly recommending the culture of potatoes in all parts of the kingdom as a precaution against famine. This was referred to a committee, and upon their report, the thanks of the society were given to Mr Buckland, all the members who had lands were entreated to plant them, and Mr Evelyne was directed to mention the matter at the end of his "Sylva," a book then publishing under the auspices of the society. These exertions of a scientific body do not seem to have produced much effect. In books of gardening published towards the close of the seventeenth century, potatoes are spoken of in no very high terms. "They are much used," says one writer, "in Ireland and America as bread, and might be propagated with advantage to poor people." Another says, "I do not hear that it hath been yet essayed whether they may not be propagated in large quantities for food for swine and other cattle." The famous nurserymen London and Wise have not considered the potato worthy of a place in their Complete Gardener, published in 1719; and several other writers speak of it as far inferior to radishes! This was more than 100 years after its introduction. One reason, certainly, that the plant remained so long in disrepute, was the defective mode of its culture. The early planting and late raising of the potatoes, very much injured their quality. This and ignorance of the proper mode of cooking them, would make them certainly anything but a tempting article of food. The following anecdote illustrates this. "A person who had been invited to taste the first potatoes planted in the county of Forfar, about the year 1730, related that the roots had been merely heated, and that they adhered to the teeth like glue, while their flavour was far from agreeable. The food was about to be condemned through the ignorance of the cook, when the accidental arrival of a gentleman, who had tasted a potato in Lancashire, caused the rejected roots to be remanded back to the hot turf ashes, till they became as dainty as they had before been nauseous."

According to the old Statistical Account of Scotland, potatoes were first cultivated in the fields there, in the year 1739, in the county of Stirling: and Dr Walker assures us that they were not known in the Highlands and isles till 1743. It is stated in the General Report of Scotland, (vol. ii. p. 111.) as a well ascertained fact, that "in the year 1725–6, the few potato plants then existing in gardens about Edinburgh, were left in the same spot of ground from year to year, as recommended by Evelyn: a few tubers were perhaps removed for use in the autumn, and the parent plants well covered with litter to save them from the winter's frost." Notwithstanding the success that after this period attended the culture of the potato among the cottagers, its progress among the higher classes in Scotland was retarded by the opinions of the different writers on agricultural subjects, already mentioned. Famine at last gave the great impulse to the cultivation of this root, and during the latter part of the 18th century, it gradually spread over the country, and its excellent qualities became generally understood.

The Netherlands received the potato from England; and from thence it found its way into different parts of Germany. It was very late before it came into general cultivation in Sweden and Denmark, and even Saxony, but in all these countries it is universally used at present. In Switzerland potatoes seem to have form introduced about the year 1720; they now been a principal article of food there. Poland is perhaps as remarkable as Ireland for their extensive cultivation. Of late years they have been introduced into the British settlements in India, and, as bishop Heber remarks, "with great prospect of success. Many places have been found suited for their culture, and though the Hindoos at first were unwilling to adopt the use of them, their prejudices have been gradually overcome, and potatoes may some time hence rival rice in its general utility among them." "It is only within these forty years that any particular attention has been paid in France to the cultivation of potatoes. They were long regarded as an unwholesome plant, and only fit to be eaten by cattle and the most wretched of human beings. It is probable that the French had only cultivated the inferior sorts, and did not know that better kinds could be procured. Parmentier, so distinguished by his zeal for chemistry, was the first who made any successful exertions in behalf of this decried and unpopular plant. He thought that the best plan to introduce it into general use was to make it popular with the higher orders. For that purpose, in 1785, he presented Louis XVI. with a nosegay made with the flowers of the potato, and the sovereign graciously received the emblem of a plant, the most likely of any, to guarantee his subjects against the horrors of famine. This ingenious mode of bringing a plant, which had hitherto been so much despised, into fashion, was eminently successful. The courtiers, always ready to flatter the taste and wishes of their monarch, hastened to cultivate an article honoured with his regard: and thus France, in a great measure, owes the more extensive culture of potatoes to courtly flattery*."

The potato, because it grows under ground, has been usually called a root, but improperly. It more nearly resembles a kind of under ground fruit; and, in conformity with this idea, the French have given it the name of pomme de terre or ground-apple. The potato, in fact, belongs to the class of plants called tuberous-rooted, or those having roundish knobs intermixed with the fibres, which constitute the real roots that draw nourishment from the earth. These tubers or knobs have been considered as so many under ground stems, enlarged by a deposition of farinaceous matter; and when, by any chance, they lose while growing their covering of earth, and continue to grow exposed to the light, they assume the same colour as the rest of the plant. But these may rather be considered as a mode of increase analogous to the viviparous production of a part of the animal kingdom; while the seed or apple from the flower corresponds to the oviparous propagation of birds. Tuberous-rooted plants, therefore, are furnished by nature with a two-fold mode of increase. The potato, besides, may be considered a perennial plant, as it may continue to spring up for many successive years on the same spot. It belongs to the genus of plants called *Solanum*, many species of which, such as the nightshade, are extremely poisonous. In Jamaica, the root of one species is a violent purgative, and a spoonful or two is used by the natives as a dose. It might startle a person at first to find the principal food of a large portion of mankind, drawn from a vegetable belonging to so poisonous a group. Two circumstances also would seem to prove that a portion of deleterious matter does actually exist in the potato. One is, that potatoes, whether in their parent bed or in the pit in which they were preserved after being dug up, if they are uncovered, *take the wind* (as it is called), and become unwholesome food for men, occasioning sickness, and greatly disordering the body. They are easily known by being of a different colour from those of the same crop which lie at a greater depth. These surface potatoes, however, may be used as seed, and besides are not unwholesome for pigs. The other circumstance is, that the liquid contained in raw potatoes must contain some matter hostile to *animal life*, as cattle and hogs have been greatly injured by drinking of the water in which they have been boiled. To counterbalance this, on the other hand, Sir John Sinclair maintains that substances noxious to *animal* life are generally beneficial to *vegetable* life; and with regard to the juices of the potato in particular, that they contain various substances favourable to vegetation, which may be rendered of great use in the irrigation of grass lands. In different quarters of the globe, whole nations subsist on roots which are deadly poison in their unprepared state, but which become safe and nutritious when cooked by fire. The most remarkable examples of this are found in the natives of the Molucca and Society islands, and the Indians of South America. In the island of Hayti, the juice of the very root which is used when dressed in the same way as we employ the potato, has been often swallowed by some of the miserable natives to put an end to their existence. Oviedo relates, as an eye witness, that these unhappy wretches, who, like many African tribes, preferred death to slavery, united together by fifties to swallow at once the poisonous juice of the Jatropha.

All vegetable productions affording food are found to contain, in some proportion or other, a farinaceous or granular substance devoid of fibre, which, when dried, may be ground or pounded into flour or meal; and which, if boiled in water, will form with it a pulpy matter. The vegetable substances which contain most of this matter are seeds and tubers, these parts of the plant being intended by nature to contain a store of food, as it were, for the young germ, sufficient to nourish it until the production of members or instruments capable of collecting nutriment for it after its exclusion, precisely analogous to the provision of yolk laid up in the egg of a bird for the young being inclosed in it. From accurate chemical examination, it has been found that in every 100 parts of the potato, there are about 70 parts of water and 30 of potato-meal, which is a powder of a greyish colour, having the taste of the raw root. This meal being submitted to further analysis, is found to be composed of three different substances. 1st, Starch or fecula, 16 parts; 2d, Leafy or fibrous matter, 9 parts; and, 3d, Soluble mucilage, 5 parts. The potato also contains a very small portion of potash, and a few other substances, such as oxides of iron and manganese, common salt, &c., but in such minute quantities as not to affect the general statement. An essential oil likewise exists in the potato, which gives its taste, but this is also very trifling. The composition of the potato root is extremely similar to that of the seeds of wheat and maize, though, from the dissimilarity in taste and external appearance, this would not be at first suspected; and hence arises the corresponding fitness of all three for food. The principal difference between wheat and potatoes consists in the presence of a substance called *gluten* in wheat, which strongly resembles animal glue, and which is the cause that wheat, rye, and barley are the only kinds of grain of which loaf bread can be made; this *gluten* giving tenacity and firmness, while it at the same time promotes the fermentation in the making of bread, as well as gives it its taste. In potatoes, oats, beans, peas, rice, maize, buckwheat, &c., this is entirely wanting, and therefore they must be mixed with a certain quantity of flour before they can be made into bread.

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* Sir John Sinclair.

There is perhaps no species of food that can be consumed in a greater variety of ways than the potato. Among us the only modes in use are three or four, such as boiling, roasting, or frying; but our French neighbours, who surpass us and all the world in everything relating to cookery, at least so far as infinite variety is concerned, have several other ways of preparing this root. A French gentleman invited to dinner thirty-two of his friends, promising to each a different dish, and yet all composed of the same material. They assembled, found before each seat a cover, and, upon taking their seats, discovered that each guest had really a different dish, though all formed of eggs! One of the company immediately repeated the invitation to all the persons present for next day, when he promised to regale them in a similar manner, on another single substance metamorphosed into thirty-two different forms. They came and dined very comfortably on thirty-two distinct and palatable dishes, all composed of potatoes! Boiling is the simplest, cheapest, and perhaps most nutritious mode of cooking the potato. When boiled, the nourishing substances contained in it are taken into the stomach, more intimately diffused through about three times their weight of water, than is the case with any artificial mixture of the potato-meal and water. Hence the easiness of digestion and lightness of this root above almost all other farinaceous substances equally nutritive; while its cheapness, and the ease with which it can be cooked, are great arguments in its favour with the great body of the people. Every one knows that, simple as the process of boiling a potato appears, there is really a peculiar art or dexterity required; and it is often remarked, "that good potatoes are less frequently to be seen at the tables of those who keep professed cooks than in the wooden bowl of the peasant." But the fact is, that in the one case there is only one dish to attend to, whereas in the other there are many, and that the potatoes of the cottager are consumed *hot from the fire*, as soon as they are ready, which is not the case in the other instance. Next to boiling, roasting the potato is the mode most employed; but this is exceptionable, as the root retains in it much of that black unwholesome liquid already mentioned. This resides principally in the skin, and hence those persons who have been tempted to eat the roasted skin, have been often seriously disordered by it. Custom, however, is found to render the stomach callous to its effects, as is evident from the practice of the children of the Irish peasantry. Throughout all Ireland it is usual to allow the little children in every cottage to *roast potatoes* for their own use, as often they please, in the turf ashes.

The first manufactured ingredient derived from the potato was starch. This substance, formerly obtained from wheat alone, was first discovered in the island of Chios, in the Grecian Archipelago, and was in common use among the Romans. The potato starch is made by the simple process of grating the roots into clear spring water, when it separates from the other particles, and sinks to the bottom. It is a very remarkable circumstance, that in *frosted* potatoes, it is only the *juice*, or liquid part of the root that is affected, and not at all the farina or flour, which may be equally well extracted, and will be found as white and good as if it had not been frozen, provided the root is not quite rotted, which in process of time it will become. The following singular illustration of this took place in 1794: A field of potatoes at Camstradden, in Dumbartonshire, was laid under water, by a sudden rise of Lochlomond. A quantity of these was got up, and in part brought home. Being wet, they were laid on the floors of out-houses to dry; but in a few days they were so spoiled as to be unfit for feeding cattle. A heap of the potatoes was left on the ground; when turned over next spring, some starch was found at the bottom, which excited a suspicion, that though the root had been affected by the frost, yet that the flour had remained uninjured. This was found to be the case; and a quantity of the farina was collected from the heap, part of which was distributed in Dumbartonshire, and the remainder was brought to Stirling, in 1804. As arrow-root had become fashionable about that time, it was often used as a substitute; and many eat of it without knowing the difference. In 1825 a dish of it was made with milk, and two gentlemen who supped on it, declared that they would not have known it from arrow-root. A specimen of this same flour of 1794 was sent to Sir John Sinclair in 1826, and it seemed as good as any produced from the potatoes of that year, after having been kept for above thirty years. Potato-flour is very easily converted into jelly, in the same way as arrow-root, by gradually pouring into it some boiling water, and stirring the mixture about; and in this shape it is strongly recommended as food for invalids, sometimes being taken with a little milk and sugar. With the addition and thorough mixture of a little wheaten flour, or ground rice, while it is boiling, it forms a pleasant and nourishing diet either with or without milk. It is well known that the manufacture of bread, even when conducted by the most skilful and experienced bakers, is sometimes very difficult. From the various casualties to which wheaten flour has been liable, from disease in the crop, or bad management in the keeping or grinding of the grain, it frequently loses some of its most essential qualities, and causes the bread, in defiance of the baker's art, to contract a sourness, which is both disagreeable to the taste, and prejudicial to health. Fortunately a remedy has been discovered of late years; that of mixing with the flour a small quantity of *potato-starch, previously converted into a* *jelly*. This kind of bread is remarkably light, and keeps longer moist than other bread. It toasts much better, and makes better bread puddings. Another most important use to which potato-flour can be applied, is to give it, boiled in milk, in the proportion of *two* spoonfuls of flour to *one* pint of milk, to young children, brought up by hand, and not at the breast, or after they are weaned from the breast. A great quantity of starch is consumed in making what is called the *dressing* for weaver's webs. Until of late, this was entirely made from wheat, and still a great proportion of it is so. But if potato starch were universally adopted for the purpose, as is the case now throughout France, a very great consumption of wheat would be saved. This substance is also put to another use, namely, the making of size, which, for some purposes, such as white-washing, is greatly superior to common size, as it has no offensive smell, and has a more durable whiteness.

The next useful product derivable from the potato is sugar. The discovery by chemical analysis, that the potato, though far different in form, taste, and all external qualities, was perfectly similar in component parts to the different kinds of grain used for the food of the man, led naturally to inquiries, whether the products derived from these grains, by submitting them to different chemical operations, might not be procured also from this root. Complete success was the consequence. It was found, among other things, that a substance, possessing all the properties of sugar, though differing a little from that of the sugar cane, could be procured by a simple operation from the potato. Until lately, however, the discovery was considered only as a matter of curiosity, and was mentioned only among men of science. Experiments were tried, on an extensive scale, in the United States of America, to ascertain whether, in districts where the potato grows abundantly, this sugar might not be made advantageously both to the population of the district, and to the manufacturer himself. The potatoes were ground by a very ingenious and simple method, by exposing them through a box or hopper to the action of a wooden cylinder, having nailed upon it long strips of iron punched full of holes, to give them a rough grating surface. This cylinder was driven by a band of leather attached to the drum of a water-wheel. On filling the hopper with potatoes, and giving the grater the necessary motion, the potatoes were reduced with surprising rapidity to a fine pulp, from which, by the aid of a sieve and water, the starch, in great purity, was readily obtained. This apparatus ground 3500 bushels of potatoes without the least repair. The starch thus obtained was then dissolved completely in water, heated by steam let into it. A certain quantity of sulphuric acid, or vitriol, was then mixed with it, and heat being applied, the whole of the starch was converted into syrup. This was purified from the acid by adding quicklime, and then evaporated; when the result was an excellent sugar fit for all domestic purposes. A bushel of potatoes, weighing 60 lb., gives 8 lb. of pure dry starch; and from these 8 lb., 7½ lb. of sugar are obtained. This sugar ferments briskly, when made into beer, and yields a healthful and pleasant beverage. It will be of most use, however, for making sweetmeats, and may be used at table in place of honey, for which it is a good substitute. It has already become a great favourite with most persons who have become acquainted with it. Its taste is that of a delicious sweet, and as an article of diet it is probably more healthful, and less oppressive to the stomach, than any other sweet substance in use.* Potatoes are used extensively in the eastern part of Russia for making treacle, which is quite as sweet and good as that which we obtain from the tropics, but having less consistence.

As all substances containing saccharine mătter are capable of producing ardent spirit, we would naturally be led to expect, from the foregoing remarks, that it might be procured from the potato: and such is the fact. In 1747, experiments on the distillation of brandy from potatoes were made in Sweden, and the result was so favourable that it was proposed to substitute them in a great measure for grain. In England Dr Anderson was the first who obtained spirits from this plant, and the account which he published of his operations is very interesting. The potatoes were boiled to a pulp, bruised, and the skins thrown away. Water was then added, and a great quantity of yeast mixed with it. In twelve hours it fermented, and this was kept up by occasional stirring for a fortnight. The liquor, which was now slightly acid, was distilled, and, from seventy-two lb. of potatoes which had been used, was obtained a gallon of pure spirits considerably above proof, and a quart more below proof. "This," says the doctor, "was in every respect the finest and most agreeable vinous spirit I ever saw. In taste it somewhat resembled brandy, but it was more mild than any brandy I ever tasted; and had a certain kind of coolness on the palate peculiar to itself, by which it might be readily distinguished by a nice judge from any other kind of spirit. Its flavour more nearly resembled brandy impregnated with the odour of violets and raspberries, than anything else to which I could compare it. A single glass of it put into a bowl of rum punch, made it appear as if it had consisted half and half of rum and brandy, impregnated with the juice of raspberries. It seemed to derive its flavour from a subtile essential oil of a very singular kind." "I have been at great pains," continues the doctor, "to describe this kind of spirit in its state of perfection, because I have since heard of and seen some spirits said to be drawn from potatoes, which, from want of skill or caution on the part of the operators, were intolerably nauseous."† It has been supposed, as before remarked, that, with proper management, potatoes might form a cheaper material than barley to extract spirits from; and accordingly, in the isle of Guernsey, there was a distillery where they were used with success; and, in 1821, there were actually in Paris *twenty* distilleries for extracting brandy from the potato starch, and nearly as many more within a circle of eight leagues round it. In 1822 these were all put a stop to, for some reason connected with the revenue laws.

The next product of the potato is a kind of *cheese*. The manufacture of this is carried on in Thuringia and Saxony, and it has the advantage of retaining its freshness for several years, provided it be kept in close vessels. It is prepared by boiling the potatoes, and reducing them, when cold, to a pulp, rejecting the skins. Sour milk is added, or else sweet curd with the whey pressed out, in the proportion of a pint to five lb. of pulp. It is kneaded several times, drained in small baskets, and simply dried in the shade.

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* Silliman's Journal.

† Bath Society Papers.

In some parts of Germany potatoes are put to another use. The lower classes are accustomed to incorporate them, after being steamed and reduced to a paste, with the butter to be spread over bread. It thus goes farther where economy is studied: and that it may longer be preserved, is often salted.

It will surprise many to learn, that a mode has been suggested by a French chemist for converting potatoes into a substance resembling *coffee*. He mixes some best olive-oil with a certain portion of dried potato-flour, and then adds a small quantity of coffee-powder. He asserts that this will produce a liquor more agreeable than coffee.

Chemical ingenuity has likewise converted this most useful root into substitutes for many other articles; as chocolate, tapioca, and vermicelli. A chemist in Copenhagen has discovered that the flowers of the plant may be used in dyeing. By this means a beautiful yellow colour may be obtained, which is solid and durable. By plunging the colour into blue, it becomes a perfect green. It has likewise been found, that the juice contained in the potato will produce a gray colour of great beauty. The liquor drawn off in the process of making potato-starch will clean silks, woollens, or cottons, without damage to the texture or colour. It is also good for cleaning wainscots.

Potatoes are used with excellent effect in the boilers of steam engines, for preventing the gathering of a calcareous incrustation on the bottom, which is gradually deposited from the water employed. The potatoes give out a glutinous substance which entangles the particles in the water, and prevents them from incrusting the iron of the boiler. A medical use of the potato has been lately suggested in a valuable French publication; namely, as a preventive of, and even cure for, the scurvy. Roasted potatoes were administered with perfect success to sailors afflicted with the disorder, after other approved medicines had been given in vain. As *roasted* potatoes are the most effectual, it seems probable that the remedy depends on some of the substances contained in the black liquid which boils out of potatoes, and which is retained in roasting.

PRESCOT; a town in the county of Lancaster, on the great road between Liverpool and Manchester, 197 miles from London, and 8 east from Liverpool. It is situated in the neighbourhood of extensive coal-mines, from which Liverpool is chiefly supplied with fuel. The Liverpool and Manchester railway passes about one mile from the town. The parish church, dedicated to St Mary, is an ancient edifice: in the year 1789 the old steeple was taken down and replaced by an elegant tower and spire. Prescot has long been noted for the manufacture of watch tools, as also part of the watch called movement work. The small files manufactured here are said to be the best in the world, and great numbers are annually exported. Several manufactories of coarse earthenware, some of which are famous for the making sugar moulds, are established here. The cotton business, though not conducted here to any great extent, gives employment to many. Population of the town in 1841, 5451; of the whole parish, which embraces fourteen other townships, 35,902.

PREVOST, Pierre, a voluminous writer on subjects chiefly of natural science, and the translator, also, of many English works into French, was born in 1751, and was originally destined to follow the profession of his father, who was one of the pastors of Geneva: at the age of twenty, however, he abandoned the study of theology for that of law, the steady pursuit of which, in time, gave way to his ardent passion for literature and philosophy; at the age of twenty two, he became private tutor in a Dutch family, and afterwards accepted a similar situation in the family of M. Delessert, first at Lyons, and afterwards at Paris. In this latter city he commenced the publication of his translation of Euripides, beginning with the tragedy of Orestes; a work which made him advantageously known to some of the leading men in that great metropolis of literature, and led to his appointment, in 1780, to the professorship of philosophy in the College of Nobles, and also to a place in the academy of Berlin, on the invitation of Frederick the Great. Being thus established in a position where the cultivation of literature and philosophy became as much a professional duty as the natural accomplishment of his own wishes and tastes, he commenced a life of more than ordinary literary activity and productiveness. In the course of the four years which he passed at Berlin, he published *Observations sur les méthodes employées pour enseigner la morale; sur la théorie des gains fortuits; sur le mouvement progressif du centre de gravité de tout le systéme solaire; sur l'origine des vitesses projectiles; sur l'économie des anciens gouvernements; sur l'état des finances d'Angleterre;* and he also completed the three first volumes of his translation of Euripides. There were, in fact, few departments of literature or philosophy which were not comprehended in the extensive range of his studies and publications. In the year 1784, he returned to Geneva to attend the death-bed of his father, when he was induced to accept the chair of belles lettres in the university, an appointment which he found on trial little suited to his taste, and which he shortly afterwards resigned. For some years after this period, he was compelled, more by circumstances than by inclination, to partake largely in those political discussions, which, for some years, agitated his native city, and which afterwards, resumed upon a wider theatre, shook to its centre the whole framework of European society; but he gradually withdrew himself from political life on his appointment to the chair of natural philosophy in 1792, and devoted himself from thenceforth, with renewed activity and ardour, to pursuits which were more congenial to his tastes. In 1790, M. Prevost published his *Memoire sur l'équilibre du feu*, and in the following year his *Recherches sur la chaleur:* these important memoirs were followed by many others on the same subject in various scientific journals; and the general results of all his researches and discoveries were exhibited, in a systematic form, in his well-known work *Sur le calorique rayonnant*, which was published in 1809, and in which he fully developed his *Theory of Exchanges*, and was enabled to give a consistent explanation of the principal facts which were at that time known respecting the nature and propagation of heat. He contributed papers to the Transactions of the Royal Society of London in 1797 and 1803; the first containing an explanation of some optical experiments of lord Brougham, and the second, some remarks on heat and on the action of bodies which intercept it, with reference to a paper by Dr Herschel; and in

1806, he became one of the foreign members of the Royal Society. In 1799, he obtained the first *accessit* for an essay *Sur l influence des signes relativement à la formation des idées*, which was written for a prize, adjudged to the celebrated Degerando, proposed by the Institute of France: and he was shortly afterwards elected a corresponding member of that body. His *Essais de philosophie, et études de l'esprit humain*, appeared in 1804, to which were appended some very remarkable essays of his friend and ancient preceptor Le Sage, of whom he published a most interesting life in the following year. He likewise published, in very rapid succession, translations of the Rhetoric of Blair, the Essays and posthumous works of Adam Smith, the Elements of Philosophy of Dugald Stewart, the Essay on Population of Malthus, Salt's Travels in Abyssinia, the Conversations on Political Economy, by his wife's sister-in-law, Mrs Marcet, and many other works of less importance and interest. In 1823, at the age of seventy-two, though still vigorous and active both in body and mind, he resigned the professorship of natural philosophy, in wise anticipation of the approach of that period of life when men naturally feel reluctant to acknowledge the decline of their faculties, or incompetent to perceive it. From this time, though still consulted by his colleagues and fellow citizens on every important subject connected with the academy or the state, he retired into the bosom of his family, which contained within itself, in a very uncommon degree, every element of tranquillity, contentment, and happiness. His own temper was singularly equable and tranquil; and his tastes and pursuits, which rarely left his time unoccupied, saved him from that *tædium vitæ* which sometimes renders old age querulous and discontented. Thus happily disposed and happily circumstanced, it is not wonderful that his life should have been prolonged beyond the ordinary limits of humanity. He died on the 8th of April, 1839, in the eighty-eighth year of his age, surrounded by his family, and deeply regretted by all who knew him. The philosophical character of M. Prevost had been greatly influenced by that of his master Le Sage, a man of great originality and profundity of thought, but whose speculations, particularly those which attempted the explanation of the cause of gravity, trespassed somewhat beyond the proper limits of philosophy. We consequently find him disposed to explain the laws of the propagation of heat and light on the most simple mechanical principles, and to trace their origin and progress much further than the experiments or facts will properly warrant; thus giving to his conclusions, in many cases, a much more hypothetical character than would otherwise have attached to them. M. Prevost had little acquaintance with the more refined resources of modern analysis; and his researches on many important branches of experimental and philosophical inquiry were consequently limited to reasonings which could be carried on by the most simple algebraical or geometrical processes. But, notwithstanding the restrictions which were thus imposed on his progress, the range of his philosophical researches was unusually extensive and various, and his discoveries on heat must always be considered as constituting a most important epoch in a branch of science which has recently received so extraordinary a development in the hands of Fourier, Forbes, Melloni, and other philosophers.

PRICE, Major David, Bombay army; member of the royal Asiatic society, and of the royal society of literature, was a native of Wales, where his father was a clergyman. In 1780, he embarked for India, having obtained the appointment of a cadet in the army there. On the voyage thither, his vessel, the Essex, bore a distinguished part in the skirmish between the squadrons of Admiral Suffrien and commodore Johnson, in Porto Praya bay, off the island of St Iago. Immediately on his arrival in India, he as an acting ensign, was thrown into active service on the Coromandel coast, under general Sir Hector Munro, and at Trincomalee, with the naval force of admiral Sir Edward Hughes. He afterwards distinguished himself in the wars with Tippoo Saib. At an unsuccessful attack on the fort of Darwar, on the 7th of February, 1791, he was severely wounded in the arm and ankle, rendering necessary the amputation of his leg. On the surrender of the fort he proceeded to Poona, where he remained attached to the military escort of Sir Charles Malet, our political minister at that court, until the peace of Seringapatam. He was then removed to a staff situation at Surat. It was in this city that he made his celebrated collection of Persian and other historical works. He had there leisure to pursue his researches, assisted by most of the standard historians of Persia and Arabia, which terminated in the publication of that great repository of Mahommedan history, of which farther mention will presently be made. In 1795, being a captain by brevet, he was appointed judge advocate of the Bombay army. This office he held until his departure from India. He was present at the memorable repulse of Tippoo's vigorous attack on the Bombay army, before its junction; and afterwards, at the operations of the siege and capture of the Sultan's capital. The Bombay army appointed captain Price their prize agent for that important booty, seldom, if ever, surpassed, as to amount, by any conquest of a British army. After arranging the slain sovereign's magnificent assemblage of jewellery, his fine library, and other matters connected with that confidential appointment, captain Price returned to Bombay, and prosecuted with eagerness and industry his compilation and translations from his valuable collection of Oriental manuscripts. In June, 1804, he attained a majority; and in February, 1805, after a continued service in India of twenty-four years, he sailed from Bombay, arrived in England in September following, and in October, 1807, he finally retired from the service.

Major Price repaired to Brecon in South Wales, and married most happily soon after his arrival in England. He became a magistrate of that borough and of the county of Brecknock; and there completed and printed the result of the laborious research of half an industrious life in four quarto volumes, under the title of "A Chronological Retrospect; or Memoir of the Principal Events of Mahommedan History, from the death of the Arabian Legislator to the Accession of the Emperor Akbar." The oriental translation committee numbered major Price among the distinguished scholars whose translations of the "Autobiography of the Emperor Jehangir," and of the "Last Days of Krishna," were published by that committee; and in June, 1830, its gold medal was presented to him, as a mark of the committee's estimation of his talents and labours. Subsequently the committee published his translation of "An Account of the Siege and Reduction of Chaitur, from the Akber Nameh of Abal Fazl." To the transactions of the royal Asiatic society, he contributed, "An Extract from the Mualijati Dara Shekohi." The MS. of the valuable work from which this translation was made, was included in major Price's munificent bequest to the Society of his collection of oriental manuscripts. The collection, here and before mentioned, extended to nearly ninety volumes. Major Price died on the 16th of December, 1835, aged seventy-three.

PRINGLE, Thomas, a highly esteemed poet and miscellaneous writer, was born in Tiviotdale, a romantic pastoral district in the south of Scotland, of which he has left some pleasing remembrances, in the poetry which from time to time he gave to the public. He applied himself early in life to literature, as a profession; and was concerned in the establishment and early management of "Blackwood's Magazine;" shortly after, however, he chose to follow the fortunes of his family, who became settlers in South Africa. There, after a time, Mr Pringle entered into some literary speculations in Cape Town, which, however, he was speedily forced to relinquish, by the government, at a pecuniary loss of little less than £1000. Upon the failure of these speculations, he returned to England; and his services were soon after engaged by the Anti-Slavery Society, as secretary to that body, a situation which he continued to hold until the object of the society was accomplished; and the duties of which responsible office, he discharged, not merely as one expected to labour for hire, but as one whose heart was in the cause of humanity and justice. As a poet, Mr Pringle's "Ephemerides" abound in graphic pictures of African scenery; and are rich in evidences of the kind and Christian spirit which accompanied the writer, in all that he did or wrote. As the editor of "Friendship's Offering," too, he brought to his task a sound judgment and a refined taste. The last work in which he was engaged, and which he finished only a month or two before his death, was the revision of his volume entitled "African Sketches," with a view to a second edition. Early in 1834, the rupture of a blood-vessel confined him to a sick bed, and greatly reduced the energies of a naturally strong constitution; and towards the autumn it became apparent, that, for the preservation of life, a removal to a warmer climate was indispensable. Mr Pringle's circumstances not permitting a trial of the south of Europe, he again turned his thoughts towards the Cape; the necessary preparations were hastily completed; the passage money was paid; and it wanted but three days of the time appointed for sailing, when a diarrhœa began to show itself, under which the powers of nature, already enfeebled by confinement, speedily sank. He died Dec. 5, 1834, exhibiting to the end that moral courage for which he had ever been remarkable, and supported by the recollection of a well spent life, and by the hopes that spring from religion. Few men were richer in friends than Mr Pringle; among their number we might enumerate most of the literary men of the day, and very many of those public men, who have made philanthropy the beacon of their political career: and although he discharged, during many years, with a fearless and honest zeal, the duties of an office which exposed him to the bitterness of party spirit, no man, perhaps, ever had fewer enemies, or descended into the grave with fewer animosities.

PRONY, Gaspard-Clair-Francois-Marie Riche de, was born 22nd July, 1755, at Chamelet, in the present department of the Rhone. At the age of twenty-one he was admitted into the Ecole des Ponts et Chaussées, and soon distinguished himself by his successful application to the severer mathematical pursuits of that establishment. Perronet, at that time chief of the school, took considerable notice of him, and, in 1783, recommended him to the minister as a fit person to second himself in the important works on which he was then engaged, and which, from his advanced age, he found it too arduous to perform without help. The celebrated Monge also discovered his worth, and became his teacher in the higher branches of analysis. In 1785 M. de Prony went with Perronet to Dunkirk, to undertake the restoration of the port; and ultimately went with him to England, where they stopped some time. In 1786 M. de Prony was ordered to draw up a plan for the erection of the Pont Louis XVI. at Paris; and after being admitted, as an honorary exception, to a discussion on the subject before the council of Ponts et Chaussées, was appointed director of the works. The government discontinued, in 1791, the appointment of M. de Prony as assistant to M. Perronet; but, with an honourable feeling, he continued to discharge his duties as before without salary, until the death of that gentleman in 1793. During this period he had enjoyed opportunities of studying practically the greatest operations thus carried on by the state, and the amount of engineering knowledge which he had acquired was very considerable. The first volume of a work on hydraulic architecture was published by him in 1790, but he subsequently relinquished the idea of finishing the work. Towards the end of 1791 he had been named engineer in chief at Perpignan; but a few months after, on the government deciding to draw up the *Cadastre*, or great territorial and numerical survey of France, he was charged with the superintendence of that immense undertaking. The political events that succeeded each other so rapidly at that period in France did not permit of his taking much part in the practical survey; but his time was fully occupied with the direction of the matter, and several other important operations were successively entrusted to his care.

One of these arose from the new metrical system just then adopted, requiring that fresh trigonometrical should be calculated, adapted to all astronomical and geodesical calculations. The government of the day, which, in some of its decisions, was guided by ideas of no small grandeur, applied to M. de Prony for the calculation of tables on the centesimal scale; and, in its instructions delivered on this occasion, desired him to take care that, "while the tables should be as exact as possible, he should make them the greatest and most imposing monument of calculation that had ever been executed or even thought of." M. de Prony, fully competent to the gigantic task, and worthy of the confidence of the state, set himself to work with the most indefatigable industry, summoning to his aid, at the same time, a large body of experienced calculators. The story goes that, wishing to find a large number of ordinary arithmeticians for the subordinate parts of the work, he took into his employment all the *perruquiers* of the capital whom he could find, and who, by the revolution, had been driven to great distress from the total destruction of their trade. In less than two years M. de Prony had finished tables containing 10,000 sines in natural numbers to 25 places of decimals, with 7 or 8 columns of differences; 2,000 logarithms of sines and tangents calculated to 14 places of decimals, with 4 columns of differences; 10,000 logarithms relative to the proportion of sines and tangents to arcs, with 3 columns of differences, for facilitating interpolation in calculations relating to small angles; the logarithms of the first 10,000 numbers calculated to 19 places of decimals, and the logarithms of numbers from 10,000 to 200,000 calculated to 14 places of decimals, with 5 columns of differences. This immense collection, forming seventeen volumes folio in MS., was to have been printed by Didot, according to a contract passed between that eminent typographer and the government; but the fall in value of the *assignats*, and other independent causes, hindered the projected impression from being completed. This great monument of the industry and talent of M. de Prony has ever since remained in the library of the observatory at Paris; and it is high time that the French government should give it to the world, since the Chambers voted a bill for the legal re-establishment of the metrical and decimal system in all its purity from January 1, 1840.

In 1798 M. de Prony was named director-general of the Ponts et Chaussées, having already, in 1794, been appointed professor of Mechanics at the Ecole Polytechnique, on the first establishment of that celebrated institution. He had also been elected a member of the academy of sciences of the institute. Napoleon, on his return from Italy, ook notice of M. de Prony, and made him some advantageous offers at the time of the expedition to Egypt, to accompany the French army to that country. M. de Prony refused, and Napoleon never forgave him. Once, when emperor, one of the ministers recommended him as a suitable person for one of the new dignities then about to be bestowed; but the emperor's reply was—"Il ne faut pas mettre son rabot en dentelles, on ne pourrait plus s'en servir pour raboter." (You must not wrap your plane up in lace, or you'll not be able to plane with it.) Notwithstanding the apparent coolness of the emperor he had the highest opinion of M. de Prony's talents, and employed him from 1805 to 1812 on important missions in several parts of France. It was in Italy, however, that his official occupations principally lay, where he executed several large works connected with the Po, and the ports of Genoa, Ancona, Venice, Pola, and the Gulf of Spezzia. The improvement of the Pontine marshes also fell to his lot; and gave rise to a very valuable geographical and hydrographical account of them, which he took the pains to draw up.

At the restoration M. de Prony ceased to be a professor of the Ecole Polytechnique, but continued attached to that establishment as permanent examiner. In 1827 he executed several missions in the departments, and especially in that of the Rhone, where he was consulted on the formation of some extensive embankments. He was named a supernumerary member of the Bureau de Longitudes in 1805, and was elected full member in 1817. He was also a member of the royal society of London (elected in 1818), and of almost all the scientific societies of Europe. M. de Prony had been one of the earliest chevaliers of the legion of honour, and was made an officer of it in 1814: in 1816 he was named Chevalier de St Michael, and, in 1828, was created a Baron by Charles X. He was made a Peer of France by Louis Philippe in 1835. His death took place on the 29th July, 1839. Besides the works mentioned above, M. de Prony's other contributions to science fill sixteen volumes, 4to. He had a brother, better known by the family name of Richie than that of Prony, who was a distinguished naturalist, and formed part of the expedition sent out to search for the unfortunate La Peyrouse, dying in 1797 from the fatigue he experienced on his long cruise.

PRUSSIA. (*a.*) *Statistics.*—In the twenty-five government districts of the Prussian States, the amount of births and deaths, during the year 1836, was—births, 550,622; deaths, 375,588: the increase, therefore, through the surplus of births, was 175,034. In the year 1835 this surplus amounted to 152,272: the increase in the two years was, therefore, 327,306. The total number of inhabitants at the end of the year 1834, was 13,509,927; accordingly, the number of inhabitants in the Prussian dominions, exclusive of the principality of Neuchatel, at the end of the year 1836, was 13,837,233. In this number is not included the surplus of immigrations over emigrations, which, however, must be in every case considerably less than the increase of population by the surplus of births.

The following was the number of inhabitants of every age and rank in the Prussian dominions at the end of 1836, taking into the account the increase of births since the last census:—

In the *government districts* of Konigsberg, 740,829; Gumbinnen, 549,410; Dantzig, 340,970; Marienwerder, 487,443; total in the province of Prussia Proper, 2,118,652. In Posen, 778,216; Bromberg, 374,082; total in the province of Posen, 1,152,298. In Potsdam, 962,850; Frankfort, 728,914; total in the province of Brandenburg, 1,691,764. In Stettin, 457,536; Coslin, 355,611; Stralsund, 157,865; total in the province of Pomerania, 971,012. In Breslaw, 1,011,735; Oppeln, 773,542; Lignitz, 809,585; total in the province of Silesia, 2,594,862. In Magdeburg, 590,440; Mersburg, 638,442; Erfort, 300,725; total in the province of Saxony, 1,529,607. In Munster, 405,661; Minden, 419,144; Arnsberg, 499,142; total in the province of Westphalia, 1,323,947. In Cologne, 420,391; Dusseldorf, 749,952; Coblentz, 464,911; Treves, 450,343; Aix-la-Chapelle, 369,494; total in the provinces of the Rhine, 2,455,091.

Total number of inhabitants in the whole Prussian dominions, as before stated, 13,837,233.

The relative numbers of the births, deaths, and the proportionate surplus of the former, as shown by the census made at the end of 1834, varied considerably in particular government districts in the course of 1836, as the following estimate, taken on an average population of 100,000 souls, shows:—

	Births.	Deaths.	Surplus.
In the Government districts of—			
Coslin,	4136	2048	2688
Stettin,	4146	2277	1869
Marienwerder,	4681	2865	1816
Bromberg,	4574	2785	1789
Frankfort,	3877	2315	1562
Dantzig,	4255	2702	1553
Stralsund,	3877	2340	1537
Posen,	4117	2679	1438
Potsdam,	3963	2542	1421
Mersburg,	4018	2634	1384
Dusseldorf,	4036	2655	1381
Minden,	4398	3025	1373

	Births.	Deaths.	Surplus.
Treves,	3855	2508	1347
Arnsberg,	3953	2708	1245
Magdeburg,	3784	2557	1227
Coblentz,	3949	2739	1210
Erfort,	3894	2706	1188
Konigsberg,	4071	2957	1114
Cologne,	4073	2962	1111
Oppeln,	4810	3761	1049
Breslaw,	4118	3070	1048
Aix-la-Chapelle,	3726	2697	1029
Gumbinnen,	4141	3127	1014
Lignitz,	3930	3149	781
Munster,	3169	2471	698
In the Prussian doms. generally,	4076	2780	1296

There were more births than deaths in all the government districts, and in the above table the order of the districts is ranged according to the amount of the surplus of births over deaths.

The marriages in the Prussian dominions, during the year 1836, are distributed to their respective government districts in the following table, which exhibits both the total number in each district, and also the relative proportion of the district marriages to the 100,000 inhabitants, according to the census taken at the end of 1834:

	The total number of Marriages contracted in the Government Districts, during 1836.	The average number of Marriages on 100,000 Inhabitants.
Konigsberg,	6770	931
Gumbinnen,	5050	932
Dantzig,	3253	978
Marienwerder,	5059	1073
Posen,	7110	938
Bromberg,	3796	1048
Potsdam, with Berlin,	8849	940
Frankfort,	6245	879
Stettin,	4015	904
Coslin,	3075	896
Stralsund,	1502	976
Breslaw,	8982	906
Oppeln,	8147	1075
Lignitz,	7511	941
Magdeburg,	5328	923
Mersburg,	5490	884
Erfort,	2588	885
Munster,	3384	846
Minden,	4053	995
Arnsberg,	4385	903
Cologne,	3699	899
Dusseldorf,	6833	937
Coblentz,	3849	850
Treves,	3455	790
Aix-la-Chapelle,	2963	819
In the Prussian States,	125,391	928

Thus, all the districts taken together, brings the year 1836, with reference to the number of marriages, into the category of ordinary, medium years; since, on the average of 100,000 inhabitants, 928 new marriages were contracted, which is equivalent to saying, that out of rather more than every 107, and less than every 108, existing contemporaries, one matrimonial union was formed. The number of the existing marriages, according to the last census, made at the end of 1834, amounted to 2,278,333. There was then, for every 1000 of these marriages, on an average, 55 new marriages in 1836, or there were very nearly 6 new to every 109 of the existing marriages—that is, almost 1 new to 18 of the old.

The number of children born in wedlock, in the course of 1836, was:—

Boys,	263,960	
Girls,	248,500	
Together,		512,460

Out of wedlock:—

Boys,	19,540	
Girls,	18,622	
Together,		38,162
Total,		550.622

Accordingly, of 100,000 children, 6931 were illegitimate; and therefore less than $\frac{1}{13}$ but more than $\frac{1}{14}$ of the children born were illegitimate; or, to be more accurate, of all the children born, $\frac{7}{101}$ were illegitimate.

These, also, have been the usual proportions for several years past in the Prussian dominions.

The proportion of the census made at the end of 1834, to the number of illegitimate children born in the course of 1836, is very different in the several districts. There occurred, for example, upon 100,000 inhabitants:—

In the Government Districts.	Illegitimate Births.
Breslaw,	407
Dantzic,	399
Potsdam, with Berlin,	397
Stralsund,	392
Lignitz,	387
Mersburg,	375
Konigsberg,	357
Magdeburg,	339
Frankfort,	336
Stettin,	301
Erfort,	282
Gumbinnen,	278
Coslin,	275
Oppeln,	265
Marienwerder,	236
Bromberg,	224
Minden,	224
Posen,	218
Arnsberg,	210
Cologne,	208
Treves,	149
Dusseldorf,	139
Aix-la-Chapelle,	135
Coblentz,	130
Munster,	94
In Prussia for every 100,000 inhabitants,	282

In the great towns of Prussia, the proportion of the illegitimate children born during 1836 to the number of inhabitants, in the census taken at the end of 1834, was as follows, on every 100,000:—

Towns.	Illegitimate Children.
Breslaw,	65
Konigsberg,	61
Berlin,	60
Posen,	60
Dantzic,	52
Cologne, with Deutz,	49
Stettin,	43
Magdeburg,	38
Aix-la-Chapelle,	25
Elberfeld, with Barmen,	16

It is ascertained, by experience, that in a great part of Europe the number of males, in comparison with females, does not bear the same proportion among illegitimate children as among those born in wedlock. In the fifteen years from 1820 to 1834, on an average, for 10,000 females, the males were—born in wedlock, 10,597—the illegitimate, only 10,310: the surplus of boys, therefore, in the first case, amounted to nearly 6, and in the second case to only $3\frac{1}{10}$ per cent. In the single year, 1836, the difference was less; for instance, in that year there were, for 10,000 female children 10,622 males born in wedlock, and 10,494 illegitimate. Whether the difference between the one surplus and the other be merely an accidental fluctuation or a permanent change, has not been determined.

Prussian Commercial League. There is, perhaps, no measure connected with commerce that has occasioned so much discussion in the present day as the Prusso-Bavarian league, which, under the name of *Zoll Verein*, has united, for the purposes of trade, ten of the otherwise independent states of Germany. The arrangements for perfecting this union were in progress during many years, and it came into practical operation at the beginning of 1834. Previous to that time, the states of which the union is composed, did not allow of the introduction of merchandise across their respective frontiers without the payment of a duty; and in some cases, where domestic industry was to be "protected," the importation of many articles was prohibited. The principle of the commercial league is to destroy all the frontier custom houses between the leagued states; to allow of the freest intercourse between the subjects of all the different states composing the union; and thus to give to the inhabitants of each the fullest advantage to be derived from a community of interest, and from extending, in a most important degree, their markets for supply, and the field for the exercise of their industry. Duties on the introduction of merchandise from countries not comprised within the union have, since the 1st of January, 1834, been collected at one uniform rate at custom houses established on the exterior boundaries of the frontier states; and a principle for dividing the amount of the duties thus collected has been adopted between the governments, without any consideration as to which is the country for whose immediate use the importations are intended, or to any circumstance other than the proportionate amount of population.

The following table exhibits the names of the different states composing the league, the area of each, the number of its inhabitants, and the proportionate amount which each is entitled to receive out of the entire collections made in the custom houses of the frontier states

STATES of the CONFEDERATION.	Area in German Geographical Square Miles.	Area in English Square Miles.	Number of Inhabitants.	Deductions for Military and Independent Districts.	Number of Inhabitants by which the Distribution of Revenue is regulated.	Per Centage Proportions of the Joint Revenue.
Prussia and its Dependencies,	3,157·21	109,126	13,800,126	109,473	13,690,653	54·56
Bavaria,	1,477·26	31,259	4,252,813	1,695	4,251,118	16·94
Saxony,	271·68	5,749	1,595,668	..	1,595.668	6·36
Wurtemburg,	385·15	8,150	1,631,779	..	1,631,779	6·50
Electorate of Hesse,	182 10	3,853	700,327	59,653	640,674	2·55
Grand duchy of Hesse,	179·25	3.793	769,691	..	769,691	3·07
Thuringia,	233·49	4,940	908,478	..	908,478	3·62
Grand duchy of Baden,	279·54	5.915	1,232,185	..	1,232,185	4 91
Duchy of Nassau,	82·70	1,750	373 601	..	373,601	1·49
	8,248 38	174,535	25,264.668	170,821	25,093.847	100.00
Free city of Frankfort,	4·33	92	60,000	..	60,000	*
	8,252·71	174,627	25,324,668	170.821	25,153,647	

The districts comprehended in the above abstract under the title of Thuringia, comprise:—

	Sq. German Miles.	Population.
Saxe Meiningen,	41·72	146,324
Saxe Altenburg,	23·41	117,921
Saxe Coburg Gotha,	37·60	129,740
Swarzburg Sondershausen (Upper Lordship),	16·90	23,750
Swarzburg Rudolstadt (Upper Lordship),	19.10	50,332
Principality of Reuss,	27·94	99,626
Weimar Eisenach,	66·82	226,664
Districts belonging to Prussia, included in the area of that country,	..	88,534
Districts belonging to the Electorate of Hesse,	..	25,153
District of Kaulsdorf, belonging to Bavaria,	..	434
	233·49	908,478

On the supposition that the real and single object of this peaceful confederation is, that which its promoters have put forth to the world, viz., to simplify the fiscal arrangements of the countries by which it is adopted—there can hardly be formed two opinions in regard either to its wisdom or to the benign influence which it is calculated to have upon the minds and feelings of those who are brought within its operation. It seems, however, to be very generally believed and understood that the object thus avowed is not, so far at least as the chief mover in the plan is concerned, the only or the chief motive which has led to its adoption, but that political views, extending beyond the interests of the present day, and tending to the aggrandisement of Prussia, have been the real incentives to the scheme. This belief is greatly confirmed by the facts, that, for a time at least, the revenue which Prussia will draw as her share of the duties on importation will not be of as great amount as her previous receipts from the same source; and that the unlimited competition which is now afforded to the manufacturers of Saxony must act injuriously upon various branches of industry within the Prussian states, which it had previously been the policy of that government to encourage and protect. The obvious conclusion to be drawn from these circumstances is, that Prussia, in consenting to give up a considerable part of her revenue, and to forego the full advantages of branches of domestic industry to which she had previously looked as an element of strength has the certainty of future indemnification to an extent beyond the amount of her present sacrifices; and this indemnification can only be found in the extension of her political influence.

It may be asked why, if this result be so certain and so obvious, the other states of which the union is formed have been drawn to consent to a scheme, which, although it brings some present profit, will, in the end, be productive of loss to them in the same proportion which Prussia will then realize of gain? It is not possible to go into an examination of the motives by which each of the states has individually been swayed to the course it has adopted, but there are two incentives common to the whole, which have, probably, more than all others, influenced their determination. With the exception of Prussia, all the members of the league would immediately enlarge the sphere of their commercial dealings in different proportions, varying from six-fold in the case of Bavaria to almost seventy-fold in the case of Nassau, and more than four hundred fold in that of the city of Frankfort. The degree of activity which this would give to the population in all their various relations must needs occasion an accession of commercial prosperity which would ensure the popular favour to the alteration. This is one of the incentives, and perhaps the most powerful of the two. Then the increase of revenue by which it would be attended, and still more the mode of the collection of that revenue, would render the executive governments in so far independent of their "states" or legislative chambers, and could not fail to recommend the system to the rulers at a time when the temper of the mass rendered the absence of collision upon such a subject peculiarly desirable. We may add, to these reasons, the effect that had been produced upon the public mind throughout the smaller states by popular writers, who, in pointing out the unity which the league was to impart to Germany, had flattered the pride of the people by their descriptions of the power and influence which would thence be given to them among the nations of Europe.

It has been mentioned that the arrangements for establishing the Zoll Verein were in progress during several years. Conferences upon this subject were held in Darmstadt as early as 1820, between

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* The per centage proportions for the division of the Revenue were fixed before the city of Frankfort joined the league. The same proportions are still preserved, but Frankfort's share, calculated upon the same principle, is deducted previous to the apportionment between the other states of the union.

the agents of Bavaria, Wurtemburg, Baden, Nassau, Saxony, and some other less important states; and these conferences were renewed from time to time, but were finally broken off in April, 1823. Four years afterwards, a treaty was concluded between Wurtemburg and Bavaria, the same in principle as that subsequently formed between Prussia and the states which comprise the existing Union. Next followed the treaty of Prussia with Hesse, in February, 1828; and in the following September, while the former country was endeavouring to make terms with Wurtemburg and Bavaria, and to induce them to adopt her tariff—points in which she succeeded—a third association, under the name of the *Mittel Verein*, or middle association, was formed at Cassel between Saxony, Hanover, Hesse Cassel, Brunswick, Hamburg, Weimar, the towns of Frankfort and Bremen, and some of the minor German states. The first and leading conditions of this association will serve to mark the feeling of jealousy with which the designs of the parties to the other two leagues were viewed. It provided that, during six years, none of the contracting parties should relinquish their commercial alliance, nor treat with either the Bavarian or the Prussian league. Prussia soon found means, however, to detach some of its members from the Mittel Verein; and although the remaining members entered into a new treaty in 1829, by which they bound themselves to continue in alliance until 1840, some of its more important branches fell off from it, and the Mittel Verein was dissolved. The negotiations by which these results were produced occupied some years in their discussion; and it was not until the 1st of January, 1834, as already stated, that the Zoll Verein took the consistent form which it has since maintained.

Many of the independent states in the north of Germany have hitherto withstood the temptation offered by Prussia, to bring them within the league: among these are Hanover, Brunswick, Mecklenburg-Schwerin, Oldenburg, and the free towns of Hamburg and Bremen.

The tariff of Prussia was more unfavourable to the admission of British goods than that of the other states with whom she has made this league; for which reason its progress was watched with considerable jealousy by the merchants and manufacturers of this country, who feared, with great apparent reason, that their trade would suffer in every case where additional rates of duty were imposed. From the manner in which the trade accounts are kept at our custom-houses, it is not possible to enter upon any minute examination of this question, because they afford us no means for separating the trade carried on with the countries that form the league from that maintained with other parts of Germany. If we include, as we therefore must do, the shipments of British produce and manufactures made to all Germany, in each of the ten years from 1827 to 1836, it will be seen that their average annual value has been £4,646,862., while their average annual value in the three years subsequent to the commencement of the league on 1st January, 1834, has been £4,690,760. The amount in each of the ten years has been remarkably steady, as will be seen from the following figures:—

		£			£
1827	—	4,828,956	1832	—	5,327,553
1828	—	4,573,249	1833	—	4,499,727
1829	—	4,662,566	1834	—	4,683,589
1830	—	4,641,528	1835	—	4,791,239
1831	—	3,835,768	1836	—	4,624,451

These figures do not afford any ground for complaint, on the part of this country, but it is probable that the full effects of the union in discouraging the importation of foreign manufactured goods has not yet been experienced.

The cotton manufacture of Saxony has already become of twice the extent that it had reached before the union, while the linen and woollen manufactures of that country have not experienced any increase. The reason for this difference is, that the persons engaged in the latter, which are more ancient branches of industry in Saxony, are so far "protected," that it is necessary to serve a regular apprenticeship and to obtain admission into the guilds or corporations established in the manufacturing towns, before any man is allowed to carry on the business; while the recently established cotton manufacture is without restriction or regulation of any kind, so that any person who can purchase or hire a loom is at liberty to become a cotton weaver.

The manufactures are greatly encouraged by the miserably low rate of wages in Saxony. It is stated on the best authority, that in October, 1837, "a man employed in his loom, working very diligently from Monday morning until Saturday night, from five o'clock in the morning until dusk, and even at times with a lamp, his wife assisting him in finishing and taking him the work, could not possibly earn more than twenty groshen, (2s. 6d. sterling) per week, and that another man who had three children aged twelve years and upwards, all working at the loom as well as himself, with his wife employed doing up the work, could not earn in the whole more than one dollar eight groschen (5s. 4d.) weekly.

The wretched manner in which the poorer classes in that country subsist may be inferred from the fact exhibited by official statistical returns that the annual consumption of meat in the principal manufacturing districts, including the town of Chemnitz, does not average more than twenty-eight pounds for each individual of the population, and that at least one half of this quantity consists of pork. If this provision were equally divided among the entire number of inhabitants, it would amount to scarcely more than half a pound weekly for each individual; but as the actual distribution is of course very different from this, it is probable there are many among the labouring artisans who rarely, if ever, taste animal food. The quantity of cotton hosiery made in Saxony has increased immensely of late, and from its cheapness has not only secured the monopoly of the markets afforded throughout the union, but has also been shipped largely to the United States, to the exclusion so far of the goods made at Nottingham. It may be stated, on the respectable authority already quoted, that cotton gloves are furnished by the Saxon manufacturers as low as 6 groschen or 9d. sterling per dozen pairs; stockings, at 1 dollar or 3s. per dozen pairs; and nightcaps, at 8 groschen or 1s. per dozen. Stout cotton caps, which are worn by the carmen and common people in that part of Germany, having stripes in six different colours upon a black ground, cost 12 groschen per dozen, or 1½d. sterling each.

These low prices are not the result of the same cause which has gradually reduced the cost of production in this country. Hitherto the machinery used in Saxony has been of the commonest sort, so that the cheapness of the manufactured goods has been owing to the low rate of wages, a rate which compels the artisans to labour long and diligently in order to insure for their families the scantiest supply of the most common of the necessaries of life. The capital of the English manufacturer which empowers him to employ the most perfect machinery, joined to his greater experience, have hitherto enabled him to compete successfully in most branches of skilled labour, but these are advantages which cannot be long retained in competition with greatly reduced wages. The profits which the Saxon manufacturers are thence enabled to realize will speedily lead to the introduction of improvements that will place our dearer processes at a still greater disadvantage.

The want of capital, which has hitherto been the chief obstacle to the still greater extension of the cotton manufacture in Saxony, would in time be remedied by the successful operation of the existing establishments, but the manufacturers in that country, unwilling to wait for so gradual a development of their resources, have had recourse to the expedient of establishing joint-stock companies. The total capital of associations of this character that have been recently formed, and which are now proceeding to the accomplishment of their various objects, amounted in October, 1837, to nearly thirteen millions of dollars, about two millions sterling, a large sum for that country, and the greater part of which is furnished by the bankers and other capitalists of Leipzig.*

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RAILWAYS, (*a.*) The attention of the public has been recently attracted to the subject of the establishment of a general system of railways in Ireland, and opinion appears to be much divided as to the policy of the government interfering either to promote or regulate this undertaking. The experience of Belgium, the European state which has first adopted a government system of railway communication, may throw some light upon the subject, and in some degree tend to the settlement of a question which is of momentous importance to Ireland, and which, in conjunction with other measures at present in operation, holds out the prospect of great and lasting improvement to that country.

Belgium, as we have said, is the first state in Europe which has established a general system of railways, embracing the whole of the kingdom, and planned and executed by the government at the public cost. The project was first put forth in the year 1833, and the object proposed was to unite the principal commercial towns on one side with the sea, and on the other with the frontiers of France and Prussia. In this respect Belgium is most favourably situated for the experiment of a general system of railways: it is of a compact form, of moderate extent, surrounded on three of its sides by active commercial nations, and on the fourth by the sea, which separates it only by a few hours' voyage from England. On its western side are the two large and commodious ports of Antwerp and Ostend, and its eastern frontier is only a few leagues distant from the Rhine, by which it becomes united to Southern and Midland Europe. Hence it possesses a near market for its productions, and offers many facilities for an extensive transit trade. The nature of the country, also, is most favourable, being generally very flat, and requiring but few of those costly works of levelling, tunnelling, and embankment, which have so swollen the expense of similar undertakings in this country.

The first step which the government took for the accomplishment of its object was, to employ a number of competent engineers to survey the kingdom, and to determine the main lines with reference not only to the general features of the country, but also to the interests of the several large towns, and to their internal and foreign relations. On the 1st of May, 1834, a law was passed authorizing the government to carry their project into execution. Mechlin was taken as the centre of the system, with four branches extending from that town, in different directions, to each frontier.

Northward,—to Antwerp.

Eastward,—by Louvain, Liège, and Verviers, to the frontiers of Prussia, whence it was expected that it would be continued by a private company to Cologne.

Southward,—through Brussels and the province of Hainault, to the French frontier near Valenciennes.

Westward,—by Dendermond, Ghent, and Bruges, to Ostend.

It appears doubtful whether Brussels or Mechlin is most favourably situated for the central station. The former is the seat of government, and is in a rather more direct line from Ostend, on the western frontier, to the eastern boundary; but, on the other hand, the line selected through Mechlin passes by more large towns, and the distance between Antwerp and the eastern frontier is rendered much shorter than if the line were carried through Brussels. Other considerations may have tended to influence the choice of the Mechlin line; but it is understood that regret is beginning to arise that Brussels was not made the centre of the system.

The total length of the lines projected by the first law was 239¼ English miles.

The following sections were opened at the annexed periods:—

From Mechlin to Brussels .	12·61 miles, on	5th May, 1835.
— Mechlin to Antwerp	14·60 —	3rd May, 1836.
— Mechlin to Dendermond	16·59 —	2nd Jan. 1837.
— Mechlin to Louvain .	14·76 —	10th Sep. 1837.
— Louvain to Tirlemont	11·03 —	22nd Sep. 1837.
— Dendermond to Ghent	18·95 —	28th Sep. 1837.
Carry forward	88·54	

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* 'The Progress of the Nation,' by G. R. Porter, Esq.

Brought forward . .	88·54		
From Tirlemont to Waremme	16·88	—	2d April, 1838.
— Waremme to Ans (near Liege) . .	11·87	—	
— Ghent to Bruges . .	27·65	—	12th Aug.1838.
— Bruges to Ostend .	14·60	—	28th Aug.1838.
Total . .	159·54 miles.		

By a subsequent law, dated the 26th of May, 1837, the government was authorized to extend the system by the construction of a line from Ghent through Courtray to the French frontier, on the road to Lisle, with a branch to Tournay; and by uniting the provinces of Namur, Limbourg, and Luxembourg, to the original system, by means of branch railways. The length of these additional lines will be from 90 to 100 miles. Some of them are already finished, and others commenced.

Thus the Belgian government has undertaken the task of establishing a general system of railways in that country, uniting the principal towns in the manner most advantageous to the general interests of the kingdom, without overlooking the particular interest of the several localities. The people have had the advantage of a much earlier introduction of this important means of communication, than if the undertaking had been left to private speculation,—without risk to individuals,—without the interference of private interests,—on lines, perhaps, which of themselves would have offered no temptation to private enterprise, but which as part of an extensive system will repay, either directly or indirectly, the money expended upon them. The government will, in all probability, recover its outlay from the profits of the undertaking, but will assuredly be repaid by an augmentation of revenue arising from the increased commerce and traffic throughout the kingdom. If it be objected that the government will be enabled to exercise too despotic a power over the means of public communication, the experience of similar private undertakings in our own country may give rise to a question whether the control of the state is likely to be more absolute than that of the directors of a chartered railroad.

The Belgian government, however, does not restrain private enterprise upon any other lines than those entering into the general system; and among numerous applications already made it has granted two lines, one the Upper and Lower Flénu, in Hainault, and the other from Charleroi to Vireux-upon-Meuse, on the French frontier.

All the railways established by the government, were formed with provision for a double line of rails, but only one line was originally laid down, it being the intention to add a second by degrees, according to the wants of the traffic. Between Brussels and Antwerp, the double line was completed in 1837. The same plan of commencing with a single line has been generally adopted in the United States. This circumstance must be borne in mind in considering the following statement of the expenses of construction.

The cost of ten sections, comprising the expenses of locomotive power, stations and buildings, was about £1,360,000, or £8.526 a mile. It appears from an account of the expenses up to January 1838, that the cost of construction alone amounted to 86·8 per cent. of the sum then expended; and that of locomotives, carriages, stations, and buildings, to 13·2 per cent. The outlay upon each of the six lines open at the latter period, was as follows:—

	Length. Miles.	Total Cost.	Average Cost, per Mile.
From Mechlin to Brussels	12·61	*L* 75 716	*L*.6.004
— Antwerp .	14·60	124,775	8,546
— Dendermond	16·59	76,044	4,583
— Louvain .	14·76	108,428	7,346
Louvain to Tirlemont .	11·03	128,628	11,661
Dendermond to Ghent .	18.95	105,784	5,582
Total . .	88·54	*L*.619,375	*L*.6,995

The cost, however, of four sections completed afterwards appears to have been considerably greater, and to have amounted to £10,432 a mile. The expense from Brussels to Antwerp, with a double line of rails, was £7,368 per mile; and that of the four other sections, with a single line, was £6,829. This comparatively greater cost of the latter was owing to the numerous works of art, bridges, viaducts, cuttings, and fillings, and particularly to the tunnel, of 984 yards in length, between Louvain and Tirlemont. It is worthy of notice, that the estimates of the engineers made in 1833 were exceeded on the above four sections by only 8 per cent.

Let us now compare these results with the cost of similar undertakings in this country, and elsewhere. The lowest sum yet incurred in the construction of a well-executed railway in England, is stated to be £10,000 a mile. This was the amount on the Newcastle and Carlisle, and on the Wigan lines; but of the former only about one-half the length was laid with a double line of rails. Others, however, (exclusive of lines in the vicinity of the metropolis, the cost of which is enormous,) have amounted to £40,000 a mile. The cost of the Manchester and Liverpool line was £38,553 per mile; of the Warrington and Newton, a branch of the latter, £12,470; of the Leeds and Selby, £10,500; of the Dublin and Kingstown, £41,823. The short line from London to Greenwich, of only three miles cost more than £600,000, or £200,000 a mile. The estimated cost of the forty-four railways for which acts were obtained in 1836 and 1837, was £25,692,500; their length, 1,457 miles; and the average estimated cost per mile, £17,600. But this estimate fell considerably short of the real expense. A striking instance of the insufficiency of the parliamentary estimates is afforded by the London and Birmingham railway. The estimate was £2,500,000; the cost, up to 30th June, 1838, £4,553,557, exhibiting an excess over the estimate of 82 per cent.; and a further sum of £500,000 was then required to complete it. It may be difficult to foresee all the contingencies which are likely to arise in the construction of a railway; but some measure appears necessary to prevent so great a discrepancy between the estimates and the actual cost. In France, the estimated expenses of four different projected lines between Paris and Havre, vary from £15,400 to £21,400 a mile. In comparison, therefore, with England or France, Belgium possesses great advantages in the cheap construction of railways; but it falls as far short, on the other hand, of the United States of America. There the cost is stated to fluctuate between £2,000 and £6,000 per mile; and Mr Porter gives an instance, in the second volume of the "Progress of the Nation," (p. 76), of a railway in that country which cost only £1,312 4s. per mile, and even that amount was greatly enhanced by a change in the mode of construction introduced after the line was completed.

This enormous difference of cost, not only between lines situated in different countries, but between several in this country, constructed under similar circumstances, suggests an inquiry into the causes of such a disproportion. The following have been enumerated as the most prominent:—

1st. Excessive parliamentary expenses incurred through contests carried on during one, two, or even more sessions, in obtaining a bill. This cause of expense arises out of competition between opposing lines, which is sometimes real, but more frequently fictitious, and is instituted by interested parties, not perhaps in their own names, but in those of the landowners. In many cases this charge alone, even in very long lines, has exceeded £1,000 per mile. The following statement will afford some notion of the sums which have been expended under this head. In some cases the amount contains the expenses of surveying, and other disbursements, which necessarily precede the Act of Incorporation. On the other hand, it exhibits only the costs defrayed by the companies obtaining the act, exclusive of those incurred by the different parties opposing the bill in parliament.

Statement of expenses incurred in obtaining Acts of Incorporation for the following railways:—

London and Birmingham	£72,868
Great Western	88,710
London and Southampton	39,040
Midland Counties	28,776
Birmingham and Gloucester	12,000
Great North of England	20,526
Grand Junction	22,757
Bristol and Exeter	18,592
Total	£303,269

The total estimated cost of these eight railways was £11,595,800; the above item amounted to two and a half per cent. of that sum, or nearly £500 per mile. If the same ratio be applied to the 1,475 miles, for which acts were obtained in 1836 and 1837, the amount spent in those two years under this head would be £729,500. The most extravagant, however, of the above cases, has been far surpassed by the charges attending the contest between the parties supporting the five several lines from Brighton to London. The amount has not been published, but it must have been very great; and the event was, that the government was obliged to employ an official engineer to report upon the several lines, and upon that which appeared to him the most expedient. This source of expense, it is obvious, would be in a great measure avoided by the government undertaking the responsibility of the undertaking.

2nd. The enormous demands for compensation by proprietors, through, or near, whose land the proposed line passes, and who withhold their assent, till purchased by the company on the most ruinous conditions. There are instances in which this species of extortion has amounted to £10,000 per mile. One case was the subject of a trial in the court of chancery, in which a nobleman in the county of Essex obtained from the directors of the eastern counties railway, in consideration of his withdrawing his opposition to the bill, £20,000 for land belonging to him required by the company; and £100,000 for the injury done to his estate. It is true that the avowed object of the individual in question was to oblige the company to select another line, and that the purchase might have been avoided by the adoption of that line. The latter course, however, was not followed, and an action having been brought to compel the fulfilment of the contract, the court decided in favour of the validity of the deed, and the equity of the claim. One of the grounds of his lordship's objections to the railroad passing through his property is worthy of record: the following is a quotation from the vice-chancellor's judgment:—"It further appeared from his lordship's affidavit, that his lordship was very partial to the old English amusement of fox-hunting, which was a source of high gratification, not only to himself, but to all the gentlemen in the county. His lordship's high feeling naturally prompted him to stand forward as a champion against any violence of that healthful recreation, in which they had all so long participated." The contrast afforded by the United States of America is very striking. Mr Fripp, in his account of the New York and Erie railway, mentions, that "besides the support granted by the State Loan, donations of great value have been made to the company by individuals owning lands on the route of the railway. These donations consist of many thousand acres of land: for instance, 50,000 in one county only, proffered by the proprietors for the purpose of inspiring confidence in the stock, providing for dividends, and the payment of interest, and to secure the speedy construction of the road." The circumstances of the two countries, it is true, are very different, but the fact deserves notice, as it exhibits one of the causes of the superior cheapness in the construction of railroads in the latter country.

A remarkable instance of the prevalence of the same system of extortion in France is afforded by the adjudication of the jury of expropriation upon a part of the Versailles and St Cloud railway. In one case, the lessee of a field at Versailles demanded £849 for one acre of land, and produced documents, signed by some architects of that place, in support of his estimate. It was, however, reduced by the jury to £16. Another proprietor claimed £265 for the suppression of a right of way across his land: the company offered him 10 francs for it, and the jury awarded him nothing. The whole amount claimed was reduced from £61,926 to £25,626.

A fair estimate of the proportion which the cost of land and compensation bears to the total expenses of the railway, may be formed from the average results of two of the principal lines already completed:*

	Total Cost.	Land and Compensation.	Per cent. Propor.	Average
Grand Junction	£1,512,150	£211,230	14·0	13·7
London & Birmingham	4,553.557	622,507	13·7	

If the same proportion be applied to the railways which have been actually commenced since the year 1830, and of which the estimated cost amounts to about £40,000,000, the sum payable to owners of lands and houses will be £5,500,000; and if one-fourth (a very moderate allowance) be added for deficient estimates, the total amount will be nearly £7,000,000. The effects of the diversion of so large a capital into a new channel, of the unexpected acquisition of a large amount of ready money by the agriculturist, of the destruction of houses in the suburbs of towns, and the impetus thereby given to the building trade, are well worthy of consideration, apart from the other consequences attending the construction and operation of railways.

3rd. Extravagant expenses are often incurred by companies pushing the termini of their lines too far into the centre of towns, and by carrying their lines through towns, in order to effect which it becomes necessary to purchase much valuable property.

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* The exact proportion on the Liverpool and Manchester line cannot be given, but it rather exceeded the above average.

4th. Engineers, it is believed, have incurred heavy, and sometimes ruinous, expenses, in order to render their lines mechanically as perfect as possible, without duly considering whether the advantages thus obtained will compensate for the expenditure requisite to produce them. By admitting a certain degree of undulation, accommodated to the natural inequalities of the ground, very large savings may often be effected, without introducing any serious impediments to the working of the lines. It is also in the heavy parts of the work, in cuttings and embankments, that many of those unforeseen and contingent expenses occur, which so frequently cause the actual cost of construction so much to exceed the estimated cost. The Newcastle and Carlisle railway, which has been already quoted for the economy of its construction, is remarkable for its sinuosities. There are several curves of about a quarter of a mile in radius, and in one part the line runs round the base of a hill, of very moderate diameter, at a less curve probably than other railway in the kingdom. Adopting these views, the Irish railway commissioners found that by a very inconsiderable loss of mechanical power, and without, in any respect, interfering with the working capabilities of their proposed lines, that is to say, without the introduction of any gradients exceeding the limit in their original sections (of sixteen feet to a mile), a saving of 31½ per cent. might be effected, or an amount of £1,674,000 on a line of 359 miles. The advantage of this reduction in the neighbourhood of towns may be deduced from the fact, that while the average saving per mile of the whole distance was estimated at £3,200, the saving at the entrance into Dublin was calculated at £18,200 per mile, viz:—

	Entrance into Dublin	Average of the whole.
Original Gradients .	L 52,925	L.14,813
Reduced . . .	34,508	11,639

On the Belgian railway the gradients never exceed 1 in 250. From Louvain to Ans they average 1 in 333, which is the limit adopted above by the Irish commissioners.

5th. Another source of extravagant expenditure arises from the haste with which these works are frequently pushed forward; which is such, in many cases, as to require day and night work, and many other heavy extra charges.

6th. Short lines are frequently rendered expensive by their requiring a greater proportionate number of stations, warehouses, workshops, and other establishments; those always forming a large item in the general cost of construction.

7th. The nature of the country frequently presents difficulties only to be overcome by an enormous expenditure in the formation of tunnels, cuttings, embankments, bridges, &c.

The Irish railway commissioners pronounce a decided opinion, that unless expenses of this nature can be avoided in Ireland, there is but little prospect of a general railway system being attended in that country with either private or national advantage.

It will be observed that most of the causes which have enhanced the cost of railways in this country would be in a great measure avoided, or might be controlled by the government, if the undertaking were in their hands. But supposing that their influence was merely exerted to suppress the two first causes of expenditure—parliamentary costs, and excessive compensation to proprietors of lands and houses—and the removal of the other causes were left to private judgment, it will be seen that, notwithstanding the difference in the value of land and labour in this country, the expense of constructing a railway in England under ordinary circumstances, which already falls short of that incurred in France, would not much exceed that incurred in Belgium. In this country the cost may be taken at from £10,000 to £12,000 per mile, which has been the actual cost of two lines subject to the expenses already enumerated; in France at £15,000, and in Belgium at £8,500, in both of which countries the construction is in the hands of the government.

We have not the means of comparing the different branches of expenditure in this and foreign countries. Labour, which is the principal portion, is paid higher in England; but it may be doubted whether, as compared with France and Belgium, its superior productiveness will not to a considerable extent diminish this disadvantage. Land also must be much more expensive, particularly under the present system of purchase; but we lie under less disadvantage with respect to materials and mechanical processes.

The estimate of the total expense of the several lines projected by the Belgian government is as follows, according to the statement put forth in the "Livret du Chemin de fer de la Belgique," published by the Royal Geographical establishment in Brussels. The cost of a single line of rails in a level country is taken at £6,950 per mile, and in a hilly or broken country at £8,559, an increase of 23 per cent.

158 miles	completed, at L.6,950 per mile	L.1,097,280	L.1,786,200
81¼ —	unfinished at L 8,559 —	688,920	
239¼ —	by the law of 1st May, 1834.		
37¼ —	level country, at L.6.950 per mile	L.259,200	738,000
56 —	of hilly country, at L.8,559 —	478,800	
93¼ —	by the law of 26th May, 1837.		
332½ miles	. . . . . .		L.2,524,200
	To this must be added the cost of engines and carriages, stations, workshops, and buildings, &c., about 14 per cent.		355,800
		Total . .	L.2,880,000

This sum averages £8,660 per mile. The extent of the lines proposed by the Irish railway commissioners is remarkably approximate—359 miles. Their estimate, with the reduced gradients, is £3,643,353, averaging £10,150 per mile, or 17⅓ per cent. more than the Belgian lines.

The carriages on the latter are divided into four classes, the fares of which vary according to the degree of comfort which the conveyances possess. They present a great contrast, as regards amount, with the English fares. The average charge per post league of 4,000 metres, or 4,374 yards, is,—

In Berlins	35 c.;	equal to	14·08 c.,	or less than	1½d.	p. m.
Diligences	30	—	12·06	—	1¼d.	—
Chars-a-banc	20	—	8·04	or rather more than	¾d.	—
Waggons	10	—	4·02	or rather less than	½d.	—

There are also waggons for the transport of merchandise, but it is only since the commencement of 1838 that heavy goods have been conveyed by this means. Previous to that period not even the carriages of persons travelling by the railway could accompany them; it was necessary to forward them by the ordinary roads.

The following statements will show how far the Belgian surpass the English railroads in cheapness of fares. In the former country there are four classes of carriages, the cheapest of which is only two-sevenths, or less than one-third of the English, and only four-tenths of 1d. per mile. In England there are sometimes not more than two classes, the lowest of which bears a very different and a much higher proportion to the superior carriages. The Manchester and Liverpool railway affords a favourable opportunity of comparison, as the distance is about the same as that between Brussels and Antwerp; the former being about 30 miles, and the latter 27¼ miles. The fares are as follows:—

Liverpool and Manchester, 1837.	s.	d.
Mails	6	6
Coaches	5	6
Waggons	4	0

Brussels and Antwerp, 1838.	s.	d.
Berlins	2	11
Diligences	2	6
Chars-a-banc	1	8
Waggons	1	0½

On the English line, therefore, the lowest class is nearly two-thirds of the highest, and the rate per mile for the lowest class is equal to the rate of the highest on the Belgian lines, viz.—

Liverpool and Manchester.		
Mails	2½d.	per mile.
Coaches	2⅛d.	—
Waggons	1¼d.	—

Average of Belgian Lines.		
Berlins	1¼d.	per. mile.
Diligences	1⅛d.	—
Chars-a-banc	¾d.	—
Waggons	½d.	—

The following are the rates of fares on some other of the English lines:—

Table of Fares, and Rate thereof per Mile, on various Railways.

	Great Western: to Maidenhead, 22 Miles.		London and Birmingham: Whole Distance, 112½ Miles.		Southampton: to Hartley Row, 38 Miles.		Grand Junction: Whole Distance, 82½ Miles.	
	Fares.	Rate per Mile.	Fares.	Rate per Mile.	Fares.	Rate per Mile.	Fares.	Rate per Mile.
1st Class.	s. d.	d.	s. d.	d.	s. d.	d.	s. d.	d.
Mail	6 6	3·54	32 6	3·48	..	..	25 0	3·63
Coach	5 6	3·	30 0	3·20	9 0	2.84	21 0	3·05
2d Class.								
Close	4 0	2·18	..	..	..	..	..	..
Open	3 6	1·90	20 0	2·16	6 0	1·89	14 0	2·03

TABLE CONTINUED.

	Newcastle and Carlisle: Whole Distance, 60 Miles.		Greenwich: to Deptford, 3 Miles.		Dublin and Kingstown, 6 Miles.	
	Fares.	Rate per Mile.	Fares.	Rate per Mile.	Fares.	Rate per Mile.
1st Class.	s. d.	d.	s. d.	d.	s. d.	d.
Mail	11 0	2·20	..	..	..	..
Coach	10 0	20·0	1 0	4·00	1 0	2·00
2d Class.						
Close	8 6	1·70	0 6	2·00	0 8	1·33
Open	7 6	1·50	..	..	0 6	1·00

The above table shows that among the lines having one of their termini in London, the fares are highest on the Birmingham, and lowest on the Southampton, leaving out of consideration the Greenwich line, which, from its difference of length, cannot enter into the comparison. The charge, however, on the Newcastle and Carlisle line is from one-fifth to one-third less than any of the others. It proves also that no uniform principle has guided the directors of railway companies in determining the rates of fares. In general the charge by the second class, or open carriages, is about two-thirds of that by the first class carriages; but this is not the case on the Newcastle and Carlisle line, where the proportion amounts to three-fourths; nor on the Greenwich, upon which line it is only one-half. The most striking fact, however, is, that the cost of construction appears to have no influence whatever upon the fares. There is no difference in this respect (at least in the first class carriages) between the Dublin and Kingstown line, which cost £42,000 a mile and the Newcastle and Carlisle, which cost £10,000; and a very slight difference between the Grand Junction, which cost less than £20,000 a mile, and the London and Birmingham, which cost £40,000. The fares also on the Greenwich are the same in amount as those on the Dublin railway (both short lines), although the distance is only one-half as great: but they bear no proportion to the difference of cost, which was five times greater on the former line. If this element may thus be left out of consideration, on what grounds have the directors proceeded? Simply, it would appear, on that of fixing the highest rate which the public will consent to pay, or upon the principle maintained in the post-office, of determining what quantity of traffic will yield as much profit as they require at the rates which they choose to fix, and neglecting or resisting an equivalent increase at a lower rate, because they are unwilling to incur the risk of loss by finding more carriages and more extensive accommodation. It is not sufficient to assert that the fares are moderate, and the accommodation adequate to the present traffic. The experience of the railroad system itself, compared with turnpike roads, proves that as the fares are reduced, and the accommodation is extended, the traffic will more than proportionably increase. There can, indeed, be no doubt that if the present high rate of charge be maintained, the monopoly which railways possess will prove a great obstacle to increased travelling. That the directors have little to fear from adopting a system of low fares will appear from the following comparison of the present amount of travelling in England and Belgium.

The Liverpool and Manchester railroad offers a very favourable comparison for this country, as the intercourse between those two towns is perhaps greater than between any other two places at an equal distance. The number of passengers booked at the company's offices on that line since its opening has been as follows:—

In 1830 (from 16th September to 30th December)	71,951
1831 (the whole year)	445,047
1832 —	356,945
1833 —	386,492
1834 —	436,637
1835 —	473,849
1836 —	522,991

The population of the towns on this line, exclusive of the adjacent districts, which teem with inhabitants engaged in commerce and manufactures, was, in 1831, Liverpool, 196,694; Manchester, 270,963; Warrington, 19,155;—total, 486,812. This number could not have been less in 1836 than 523,000, which is the number of passengers using the railroad in that year. On an average, there fore, each inhabitant may be supposed to take one trip in a year.

In Belgium the number of passengers booked at Brussels, Mechlin, and Antwerp, inclusive of two intermediate stations, in each year since the opening of these lines, has been as follows:—

	Brussels.	Mechlin.	Antwerp.	Total.
1835 (8 last months) .	215,342	206,097	—	421,439
1836 (Antwerp only 8 months)	379,588	265,048	226,671	871,307
1837	475,155	364,317	305,995	1,145,467
1838 (10 months) .	511,326	338,351	299,146	1,148,823

The population of these three towns did not, in 1838, amount to one-half of that on the English line, namely, Brussels, with its suburbs, 134,302; Mechlin, 22,895; Antwerp, 75,363;—total 232,960; and neither the population nor the commercial activity of the surrounding districts can be compared with those of its competitor, yet the intercourse in 1837 was more than twice as great, and with reference to the difference of population, was five times as great, the average number of trips to each inhabitant having been five per annum. A comparison with the intercourse on both lines previous to the formation of the railroads is equally favourable to the Belgian undertaking. On the Liverpool and Manchester line the average number of passengers which the coaches carried, in the year 1825, was estimated at 450 daily, or 164,250 per annum. The number actually conveyed by the railroad, in 1836, was 523,000, showing an increase of 218 per cent., or rather more than three times the former number; the fares having been reduced from 10s. and 6s. to 5s. 6d. and 4s.; the higher rates one-half, and the lower only one-third. On the Belgian line the number of passengers between Brussels and Antwerp, before the opening of the railway, is said to have been 80,000 yearly. The rates of conveyance have been reduced from 4s. and 2s. 6d. to 2s. 6d. and 1s. 0½d.; the higher fares two-fifths, and the lower three-fifths: and in 1837 the number of passengers booked at Brussels and Antwerp, excluding Mechlin, whence a portion of the passengers were proceeding on other lines of railway, was 781,250, showing an increase of 876 per cent., or about nine and a half times the former number. If Mechlin be included, the increase will be fourteen times the former number. An analysis of the classes of travellers will show that this superior activity is in a great measure owing to the cheapness of fares. Of the total number of passengers, during the six months ended 30th October, 1836, the proportion using each class of carriages was as follows:—

			Per Cent.			Per Cent.
Berlins,	paying	2s. 11d.	1·7	yielding	a revenue of	5
Diligences	—	2s. 6d.	3·7	—	—	9
Chars-a-banc	—	1s. 8d.	22·2	—	—	32
Waggons	—	1s. 0½d.	72·4	—	—	54
			100·			100·

The proportion of persons travelling short distances only in waggons is still greater, but the above is sufficient to show how large a portion of the whole revenue of the company is derived from passengers of the lower class, paying a very small fare; and it is a just inference that the high rates of fares on the Liverpool and other railroads in England do very materially check travelling; that to the artisan they entirely prohibit travelling for pleasure; that they restrain even the wealthy in the use of this source of recreation; and it can scarcely be doubted that they interfere with journeying on business. Whether an increase of numbers at a low rate would repay the corresponding additional outlay for locomotive power, wear and tear, &c., is another question, upon which the evidence afforded by the Belgian railway, is also important. The following result of the operations on all the lines since they were severally opened, tends to show that the experiment has been successful.

				Expenses.	Receipts.	Excess of Receipts.
1835	1	Section open	8 months	L.6,748	L.10,756	L.4,008
1836	1 2	— —	4 — 8 —	17,244	33,004	15,760
1837	3 8	— —	6 — 4 —	46,216	56,676	10,460
1838 10 months.	6 8 10	— — —	3 — 4 — 3 —	64,768	105,340	40,572

The cost of these ten sections, including the materials, was about £1,360,000, the interest of which sum, at 5 per cent. per annum, would amount to £68,000; and for ten months, to compare with the above, it would be £56,667. But it must be borne in mind, that the whole of the ten sections were only in operation during three months, and therefore the profits of 1838 must not be charged with the cost of all the sections. The receipts at Ans, which section was only open seven months, amounted to nearly one-third of those at Brussels during ten months, and the line from Bruges to Ostend was not open three months. The following were the receipts at each principal town:—

Brussels . .	L.29,882	Louvain . .	L 7,728
Antwerp . .	16 553	Tirlemont . .	4,218
Ghent . .	13,114	Ostend . . .	1,607
Mechlin . .	11,640	Other Towns . .	11,027
Ans	9,571		

This statement sufficiently indicates the favourable prospects of the undertaking.

With reference to the amount of profit which the Belgian government looks forward to receiving from the railways, it is necessary to state the view which they take of their position as proprietors. The undertaking might be prosecuted upon three different systems. 1st, As a work of public utility, without requiring that the receipts should cover the expenditure. 2nd, As a financial resource, and requiring that the receipts should exceed the expenditure, and yield an income for public purposes. 3rd, As an establishment which should neither be a burthen nor a source of revenue, and requiring merely that it should cover its own expenses, consisting of the charge for maintenance and repairs, with a further sum for the interest and gradual redemption of the invested capital. The Belgian government adopts the last system, and expects to realize an annual profit of 5 per cent. upon the original outlay beyond the current expenses. It has, however, been estimated, that the line from Brussels to Antwerp will yield 16 per cent.

The Belgian railways surpass those of this country, namely, in evenness of motion; but it remains to be seen how far the carriage of heavy goods, which was only commenced in 1838, will diminish this advantage. Mr Loch, in a letter addressed to lord Morpeth, and printed in the appendix to the Irish railway report, says upon this point, that "the motion is much more equal and uniform on the Brussels railway, and there is far less (I had almost said there is none) of that thumping which distinguishes the Greenwich, as well as the Liverpool railway. The carriages are neater within, and better finished; and they have none of that disagreeable swinging motion which the English carriage has, and which is so much remarked upon. Coupled with this, the breakage of the rail amounts to nothing on the Brussels railway, while it is so tremendous upon the Liverpool. Upon the former not above a dozen have been broken since it was opened (twenty months), whereas the number upon the Liverpool amounted to eighteen for the week ended 21st of January, 1837, and twelve for the week preceding. The velocities on each vary but little; the difference, however, is in favour of the Liverpool. The original rails on this road, and on the Brussels, are in weight nearly the same. The latter line has wooden sleepers throughout, and the road appears to have a certain degree of elasticity."

The velocity on the Belgian lines is, in general, from twenty-six to thirty miles an hour; which is diminished at the bridges, tunnels, stations, &c. These and the other necessary delays make the average rate twenty miles an hour.

The locomotive engines in use were manufactured by Mr Stephenson, at Newcastle, and Mr Cockerill, at Seraing: they are of different power, the diameter of their cylinders varying from eleven to fourteen inches. They have generally only two driving-wheels, but a few have four: twenty-eight carriages are fixed by law as the largest double train with two engines; from fourteen to eighteen as the number for a single engine.

There remains only to show the nature of the expenses of working the lines, divided into the principal branches. The total expenditure under this head, from the opening of the first line to the end of October, 1838, was £134,981, of which there was for—

Maintenance and Police of the Line	L.36.274 -	27 per cent.
Expenses of Carriage . .	76,379 =	57 —
— Collection . . .	22,328 =	16 —
Total . .	L 134,981	

The accounts for the first ten months of 1838 enter more into detail, of which the following is an abridgement:—

Maintenance and Police:— . .	L.	
Wages of labour . . .	13,856	
Materials . . .	604	
Salaries	652	
		15,112
Expenses of Carriage:—		
Wages of labour . .	12,700	
Salaries	1,317	
Labour at coke furnaces .	696	
Materials for consumption .	19,945	
— repairs, &c. . .	3,518	
		38,176
Expenses of Collection:—		
Wages; transport of baggage .	1.742	
Salaries of officers . .	8,145	
Miscellaneous . . .	1,592	
		11,479
Total . .		L.64,767

Among the materials for consumption, coal, coke, and wood amounted to the large sum of £17,520.

RAMOOSSIES; one of the mixed castes of India, who live mainly by plunder. They reside chiefly in the outskirts of towns and villages, in a portion of the Mahratta country, extending 200 miles from north to south, and 100 from east to west. They are in number somewhat about 20,000. The bulk of this tribe appears, from time immemorial, to have led a led a roving life, residing as far as practicable from the more civilized inhabitants, and living by occasional robbery of such travellers as fell in their way, and by regular attacks on the houses in towns and villages near which their nocturnal marches carried them. The settled population found it advisable to purchase immunity from the assailants they were too feeble to oppose; and some of the tribe were willing to receive this sort of "black mail" as a price of protection from all robbers, as well of their own body as of any other. This practice originated the system of village watchmen, which in this part of India is entrusted to Ramossy families, in whom the office has become hereditary.

But the greater part of the tribe live entirely by robbery; they have regularly organized bands, who are bound by strict rules, and joined together by oaths which they consider sacred. In robbing escorts or single travellers, they proceed much as the other predatory tribes in India, but when they attack houses, they have certain regulations which may be almost termed religious observances, from which they rarely depart. On approaching a village they carefully hide their shoes and the sheaths of their swords in the long grass, and then throw themselves into a supplicating posture, make repeated obeisances, and invoke the tutelary spirit of the place to favour their undertakings, and to crown their exertions with success, that they may obtain a valuable stock to maintain themselves and their wives and children for a long time. One of their party then takes off his turban, which is cut into three, five, or seven pieces, and moistened with ghee to serve as torches; a light is struck, the torches are kindled, and the village entered: the actual robbery is almost always effected by violence, and generally accompanied by the barbarities attending such scenes in India. If any of their party is killed, they are careful to remove the body to prevent discovery; or if they are hard pressed, cut off the head, and take it away with them; they are so apprehensive of discovery, that they will even cut off the head of any one who is so severely wounded as to be unable to make his escape, though not mortally. But they rarely come to this extremity: cunning is their usual weapon, and it is mostly successful. They are so very skilful in imitating the cries of the various wild animals which are so frequent in the neighbourhood of the native villages, that their occurrence excites no attention. When separated in flight, or divided for the purpose of a more effective attack, the whistling of birds and the howling of jackals form a sort of language of signals, by which their movements are known to each other, though unsuspected by those uninitiated. The cawing of crows is sometimes imitated very soon after midnight, to pretext the approach of morning, in order to induce sleeping travellers to rise and march before the hour that prudence would dictate; and in a country where clocks are unknown, many a traveller has been led by such means to set out hours before the usual time, lured to a secure spot, and there plundered.

In these expeditions gain is the chief motive; and although violence is often practised, murder is rarely perpetrated; stories are told of their having suffered much from their unwillingness to imbrue their hands in blood. In former times they were less scrupulous, but even at the worst, they seldom murdered without the stimulus of revenge. In gratifying this passion, they rivalled the Children of the Mist; it was disgraceful to forgive an injury, and a parent on his death-bed accounted it a sacred duty to call together his children, to remind them of any insult which remained unatoned for, and to enjoin them not to let slip the first opportunity of vengeance. Their character at present is less dark, and they may be considered simply as bold reckless adventurers; their outrages are perpetrated with every precaution that prudence could suggest, but an inconceivable heedlessness succeeds, and the neglect of the most ordinary care is constantly visible in their actions, and leads to the detection of their robberies. The most usual way in which they are found out, is their making a foolish display of their stolen goods, or offering them for sale in some shop, generally in Poona, the very place where in all probability the article was originally purchased.

READING; a town of England, in Berkshire, thirty-nine miles west from London, and sixteen from Windsor. It is situated on the banks of the river Kennet near its confluence with the Thames; and on the line of the great western road from London to Bath. Its origin and the derivation of its name are uncertain, but the former may with probability be ascribed to the Saxons, as it is not noticed in history till after the middle of the ninth century, when, according to Asser, the historian of Alfred the Great, Reading was taken by the Danes. The town has received successive charters from the reign of Henry III. to that of Charles I., the latter having been modified by George IV. The whole, however, was abrogated by the municipal reform act of 1835, which vested the government in a mayor, six aldermen, and eighteen councillors. Among the public buildings of the place are the three parish churches, St Lawrence, St Mary, and St Giles, all vicarages, besides various dissenting chapels, the town-hall, originally part of the hospital of St John, rebuilt in 1785, and the county jail, erected about the year 1793.

The town is of a triangular form, consisting of four principal streets, intersected by others of less importance. Some of the houses are partly constructed of timber-work, with high gables, in the style of the sixteenth century; but the buildings in general are of brick, and are spacious and convenient. The town is well paved; it is lighted with gas, by a joint stock company, established by act of parliament in 1825; and there is an ample supply of water, furnished by a company established in 1694. There is a handsome stone bridge of one arch, over the main stream of the Kennet, in Duke street; north-east of the town is a bridge, called Blake's bridge; and there are others over branches of the river. A small theatre is usually opened annually, for a month or six weeks. Reading abounds in charitable and educational institutions. Among them may be noticed the benefaction of Mr John Kendrick, an eminent clothier of Reading, who, in 1624, gave £7500 in trust to the mayor and burgesses, for the erection of a house for the employment of the poor, which purpose was carried into effect at the expense of £2000; and in this establishment, which, for some unknown reason, received the singular appellation of the Oracle, the woollen manufacture was for some time prosecuted with considerable success. On the 27th May, 1839, the new royal Berkshire Hospital was opened at Reading. To this institution, Mr Benyon de Beauvoir contributed the munificent sum of £4000; —£3000 towards its erection, and £1000 to the hospital. The structure is in the Grecian style, from a design of Mr Bryant.

Reading sends two members to parliament and is a polling town for the county elections. The trade of the town is more of a general nature than a marked character, and the manufactures are unimportant since the decay of the clothing trade. The interchange of various commodities between this town and London, Bath, Bristol, &c., (facilitated by water conveyance and by the Great Western railway), with its large markets, fairs, and an excellent local trade, are the chief sources of its prosperity, the latter being benefitted most materially by the many wealthy and titled individuals who have seats or residences in the neighbourhood. The principal articles manufactured are a few silk goods, ribbons, pins, sackings, &c.; there are also some boat-building yards, and it enjoys a good trade in timber, corn and malt. William of Reading, archbishop of Bordeaux in the reign of Henry III., and archbishop Laud, were natives of this place. Population in 1841, 18,937.

REGISTRATION OF BIRTHS, MARRIAGES, AND DEATHS. The keeping of parish registers, as a national measure in England, dates from 1538. They were first enjoined to be kept, on the dissolution of the monasteries. The 12th article of Cromwell's injunctions to the clergy in 1538 directs that every clergyman shall, for every church, keep a book, wherein he shall register every marriage, christening, and burial; and the injunction directs the manner and time of making the entries in the register book weekly—any neglect being made penal. This measure created great excitement. It was surmised that the registry was preliminary to a new levy of taxes.

In the first year of Edward VI. (1547,) all episcopal authority was suspended for a time, while the ecclesiastical visitors then appointed went through the several dioceses to enforce different injunctions, and, among others, that respecting the keeping of parish registers, issued by Cromwell nine years previous. The injunction was again repeated in the beginning of the reign of Elizabeth, who also appointed a protestation to be made by the clergy, in which, among other things, they promised to keep the register book in a proper manner. One of the canons of the convocation of Canterbury in 1603 (which were confirmed by James I., but never received the sanction of Parliament) prescribes minutely in what manner entries were to be made in the parish registers. "This canon," says Mr Rickman, "also contains a retrospective clause, appointing that the ancient registers, so far as they could be procured, but especially since the beginning of the reign of Elizabeth, should be copied into a parchment book, to be provided by every parish. This wise regulation appears to have been carried into full effect at the time; so that the ancient parish registers now extant usually commence with that queen's reign, and some of them earlier, quite as far back as the date of the original injunction. That part of the canon which directs the register book to be kept in a coffer in the church has not been enforced, as it was found by experience that the book was liable to be damaged by the moisture prevalent in uninhabited buildings, and also to be purloined with the other contents of the church coffer. The register book was heretofore usually kept in custody of the officiating minister, at his own house, if resident on the benefice, otherwise in that of the parish clerk."

An act was passed in 1694, having for its object a general registration of births, marriages, and deaths, but the motive which prompted it was not a consideration of the public and private advantages of the measure; it was regarded solely as a matter of revenue. It is the 6 and 7 Will. III. c. 6, and is entitled "An Act for granting to his Majesty certain Rates and Duties upon Marriages, Births, and Burials, and upon Bachelors and Widowers, for the term of five years, *for carrying on* *the war against France with vigour.*" It is a very long Act; and the amount of duty to be paid on births, marriages, and burials, according to rank or condition, is minutely set down. All persons in holy orders were directed, under a penalty of £100, to keep a register of marriages, christenings, and burials, to which the collectors of the rate were to have free access without fee. Parents were bound to give notice to the collectors within five days after the birth of a child, under a penalty of 40s. A supplementary Act was passed, (the 9th Will. III. c. 32,) entitled, "An Act for preventing Frauds and Abuses in the charging, collecting, and paying the duties upon Marriages, Births, Burials, Bachelors, and Widowers."

Considerable excitement prevailed in 1753, respecting a Registration Bill which had been introduced into the House of Commons. In the beginning of that year, Mr Thomas Potter, son of Dr Potter, archbishop of Canterbury, brought in a Bill "For taking and registering an annual account of the total number of Marriages, Births, and Deaths; and also of the total number of poor receiving alms from every parish and extra parochial place in Great Britain." It passed the Commons, but was rejected by the Lords." During its passage through the lower House, it was most strenuously opposed by a Mr William Thornton, who declared himself utterly astonished that any individual of the human species should be so presumptuous and abandoned as to make such a proposition. His argument (which he held up in various forms, until the minority that voted with him increased on each reading from 2 to 17, and 57) was that "an annual register of our people will acquaint our enemies abroad with our weakness, and a return of the poor rate our enemies at home with our wealth."

The 52 Geo. III. c. 146, made some alteration of the law respecting parish registers. This Act was entitled, "An Act for the better regulating and preserving Parish and other Registers of Births, Baptisms, Marriages, and Burials in England. It received the Royal Assent on the 28th of July, 1812. It directed that the registers of parishes, and of chapelries, (where the ceremonies of baptism, marriage, and burial were performed,) should be kept in books of parchment, or of good and durable paper, on which should be printed the heads of information required to be entered; and that the register books should be kept in a dry, well painted iron chest, in the residence of the officiating minister, or in the parish church or chapel. Copies on parchment of all registers were also to be sent annually to the registrar of each diocese. The title of this Act is recited in the preamble of the new Registration Act, and so much of it as relates to the registration of marriages is repealed.

"No person will be surprised," says Mr Rickman, "that one half of the registers anterior to A.D. 1600 should have disappeared. If any other nation possesses similar registers of that date, (a valuable proof of uninterrupted civilization,) a comparison might be instituted, and the preservation of such records through three hundred years would not prove to have been of frequent occurrence; but in point of fact, examination shows that 812 English Parish Registers commence in the year 1538, about 40 of which contain entries (copied probably from family Bibles and tombstones) anterior to the date of Cromwell's injunction; 1,822 Parish Registers commence from A D. 1558 to 1603, when the canons authorized by king James directed a copy of all parish registers to be made and preserved; and nearly one half of them (5,082) have been preserved accordingly, and are now extant. Parish registers, to the number of 969, commence between that time to the year 1650;—2,757 from A. D. 1650 to 1700;—1,476 Parish Registers from A. D. 1700 to the year 1750; the rest (six or seven hundred) since that time."

The law relative to the solemnization of marriage in England, previous to 1754, was in a very undefined state. The following brief sketch was given by Dr Lushington in the House of Commons, March 17, 1835:—"By the ancient law of this country as to marriages, a marriage was good, if celebrated in the presence of two witnesses—though without the intervention of a priest. But then came the decision of the Council of Trent, rendering the solemnization by a priest necessary. At the Reformation we refused to accept the provision of the Council of Trent, and in consequence the question was reduced to this state—that a marriage by civil contract was valid; but there was this extraordinary anomaly in the law, that the practice of some of our civil courts required in certain instances, and for some purposes, that the marriage should be celebrated in a particular form. It turned out that a marriage by civil contract was valid for some purposes, while for others—such as the descent of real property to the heirs of the marriage—it was invalid. Thus, a man, in the presence of witnesses, accepting a woman for his wife, *per verba di præsenti*, the marriage was valid, as I have said, for some purposes; but for others, to make it valid, it was necessary that it should be celebrated *in facie ecclesiæ*. This was the state of the law till the passing of the Marriage Act in 1754."

It may be added, that a common notion prevailed, that the solemnization of a marriage by a person in holy orders rendered it sacred and indissoluble. This belief was one cause of the Fleet and other marriages in London, to repress the scandals and indecencies of which the Act of lord chancellor Hardwicke was passed in 1753. But this Act, in abolishing all clandestine and irregular marriages, compelled all persons, except Jews and Quakers, to be married according to the ritual of the Church of England—so that, in curing one evil, it created another, by laying a restraint on those who differed from the Established Church, which has only been remedied by the law passed during a late session of Parliament.

The authority of the archbishop of Canterbury to grant special licences is derived from the 25 Henry VIII. c. 21, entitled, "An Acte for the exoneration from exactions payde to the See of Rome." Henry, in furtherance of his quarrel with the pope, caused an Act to be passed (32 Henry VIII. c. 38,) by which he declares "all persons to be lawful that be not prohibited by God's law to marry," and that "no reservation or prohibition, God's law except, shall trouble or impeach any marriage within the Levitical degrees."

During the commonwealth, a great number of marriages were solemnized by justices of the peace. Doubts having been raised about their validity, an Act was passed, the 12 Charles II. c. 33, entitled, "An Act for Confirmation of Marriage," in which all such marriages solemnized from the 1st May, 1642, were confirmed.

There were a number of chapels in privileged places in London, claiming exemption from episcopal visitation, where marriages were celebrated in defiance of the canon law, without publication of banns. Of these, the chapel in the Fleet prison acquired the most infamous notoriety. At first marriages were really performed in the chapel itself, but as business increased, persons in holy orders confined for debt endeavoured to earn a subsistence by marrying, and it was found convenient to have other places within the rules of the prison, until at last the various tavern-keepers in the neighbourhood fitted up rooms in their houses as chapels, some of them kept parsons on their establishment at a weekly salary, and all of them had individuals plying about to decoy or entrap people to their chapel-shops. Various ineffectual attempts were made to put a stop to the evil. In the Registration Act already mentioned, 6 and 7 Will. III. c. 6, a clause is introduced, declaring that "No person shall be married at any place pretending to be exempt from the visitation of the bishop of the diocese without a licence first had and obtained, except the banns shall be published and certified according to law," and any parson, vicar, or curate celebrating such a forbidden marriage, was made liable to a penalty of £100. Again, in the 10th Anne, c. 18, which is a well-known Act, laying duties on paper, soap, linen, &c. a clause was introduced (numbered 192) which declares that "whereas great loss hath happened of the duties already laid upon stamped vellum, parchment, and paper, *and other inconveniences daily grow from clandestine marriages*, for remedy thereof for the future, be it enacted that every parson, vicar, or curate, or other person in holy orders, beneficed or not beneficed, who shall, after the 24th of June 1712, marry any person in any church or chapel exempt or not exempt, or in any other place whatsoever, without publication of the banns of matrimony," &c. were to forfeit £100, and a similar penalty was made applicable to gaolers and keepers of prisons for permitting, or conniving at, clandestine marriages.

But these prohibitions were framed more with a view to the revenue than to the morality of the case, and the celebrators of illegal marriages probably thought that they had as much right to their income as the government. The evil increased rapidly, for the law was completely evaded and set at nought. There was a chapel in the parish of Hampstead, called Sion Chapel, which belonged to the keeper of an adjoining tavern, who, by his advertisements, invited the public out to his establishment, where parties could be married, and afterwards spend the day agreeably in his grounds. There was also a chapel, called after the name of the minister, Keith Chapel, at which an extraordinary number of marriages were celebrated. This was a somewhat more respectable place than the Fleet. But marriages at the Fleet became an enormous nuisance. An appeal case before the Lords respecting the validity of a marriage was the immediate cause of the introduction of lord chancellor Hardwicke's bill in 1753, which continued in full force until the new law came into operation on the 1st March 1837.

Lord Hardwicke's bill is the 26 Geo. II. c. 53, "An Act for the better preventing Clandestine Marriages." By it all marriages celebrated without licence or publication of banns were declared to be null and void, and the celebrators guilty of felony. It also requires that a marriage, in order to be valid, should be solemnized in a church or chapel where banns had been *theretofore* usually published. Notwithstanding the evident mischiefs it was intended to cure, the bill was very unpopular, and met with fierce opposition. The hon. Henry Fox, afterwards lord Holland, (who had himself been married at the Fleet in 1744,) and Charles Townshend were the leading opponents of the measure. Blackstone calls it an "innovation upon our ancient laws and constitution." The provisions of the law took effect from the 25th of March, 1754, and Burn tells us, that so eager were all parties to be beforehand with the law, that it appears from one register-book alone, that on that day no less than 217 marriages were celebrated at the Fleet—"which," he adds, "were the last of the Fleet weddings." An attempt was made to claim privilege for a chapel in the Savoy, but the conviction and transportation of minister and curate put an end to the practice of celebrating illegal marriages.

The clause in lord Hardwicke's Act, requiring banns to be published in some church or chapel where they had theretofore usually been, having been strictly interpreted, went to exclude churches consecrated after the passing of the act. This was remedied; but with this exception, the measure remained in full force till the new act came into operation on the 1st of July, 1837.

Government, much to its credit, bought a quantity of Fleet Marriage Registers a few years ago, and deposited them in the office of the Consistory Court of London. They date from 1686 to 1754. Along with the registers are a number of small pocket-books which were used by the Fleet parsons when they went to the different public-houses, and from which they used to enter the marriages into the larger books. But the pocket-books contain entries not to be found in the registers, such as marriages which were desired to be kept secret, &c. Considerable difference of opinion prevailed as to whether the Fleet Registers could be received as evidence in a court of law—but the more prevalent opinion was, that they might be received as declarations, requiring the assistance of other evidence.

It is unnecessary to give any account of the different attempts which have been made, especially since 1824, to procure an alteration of the marriage law. The delay may be regarded as fortunate, as the law has now been altered, in conjunction with a general scheme of registration. Whatever defects may be chargeable on the details of the two measures, (which, though developed in two Acts, are treated as, and legally affirmed to be, one,) they constitute the first national effort in England to extend to all classes, and to every kind of opinion, an unfettered participation in the securities of social life. The member of the Established Church may be married as heretofore, if he chooses; the Dissenter may be married with or without religious rites, as he pleases; and both marriages are equally valid in the eye of the law. The machinery for registering Dissenting places of worship, for the purpose of solemnizing marriages, is sufficiently free and unrestricted, consistently with a due provision for guarding against the evils which were put an end to by lord Hardwicke's Act, while it removes the obligations which were felt as infringements upon the rights of conscience which that Act perpetuated. And with all objections to the law in some details, it is a great matter to have obtained the *principle* in so clear and broad a manner. Certain rules there must be, if the state is to be expected to protect both itself and individuals, and to secure to them, without trenching either on scruples of conscience or of feeling, all the solid advantages of a well-defined marriage law. While, therefore, the Dissenter has been relieved in a way which leaves him but little to complain of in this particular affair, the Churchman has nothing whatever on which to ground an objection against it. For *he* may be married in the old way, by licence or by banns, as if the law had never been altered.

Important and obvious as are the applications of the registered facts, the measure had to encounter considerable opposition. Its advantages were scarcely perceived at first by the multitude; and some of the clergy of the Established Church threw obstacles in its way, under an erroneous apprehension that the registration of births might interfere with the administration of baptisms. By taking active steps to make known in every way the nature, advantages, and obligations of the Act, and by a firm, but conciliatory conduct, the Registrar-General succeeded beyond the most sanguine expectations, in obtaining, during the first year of its operation, an almost complete register of deaths and marriages. The register of births is less complete; but this owing to the want of a clause in the act to render the information of births imperative. The country is divided into 618 districts, over each of which is appointed a Superintendent-Registrar, and which are generally coincident with the poor law unions. In the latter end of 1838 there were 2,193 Registrars employed. Certified copies are transmitted to the General Register Office quarterly: they are collected by the Superintendent-Registrars from more than 14,000 persons charged with the duty of compiling them. More than 80,000 separate papers, containing 847,149 entries, have been thus transmitted, of which 739,737, (being all the entries of births and deaths, and such marriages as are registered by the Registrar of Marriages) have been compared with the original by the Superintendent-Registrar, and certified to be correct. The certified copies are examined, arranged, and indexed at the General Register Office, and there the abstracts are made which are contained in the Annual Report.

In the year ending June 30th, 1838, it appears that 111,481 marriages were registered; 107,201 according to the rites of the Established Church, namely, 9 by special license, 13,677 by license, 68,410 by bans, and 493 by a certificate from a Superintendent-Registrar; while in 24,612 instances it was not stated in which of the foregoing forms the marriage was performed: 4,280 marriages took place *not* according to the rites of the Established Church, namely, 2,976 in registered places of worship, 1,093 in the offices of Superintendent-Registrars, 76 between Quakers, and 135 between Jews. In the first quarter 24,030 marriages were registered, in the second 34,449, in the third 23,201, in the fourth 29,801. The mean of the three last quarters was 29,150; and this would make the annual number 116,600, while, according to former estimates, the number should have been 116,000.

399,712 births were registered—204,863 of males, 194,849 of females. The numbers registered in the first quarter amounted to 74,588, in the second to 89,528, in the third to 113,815, in the fourth 121,781. The registration of births "has, since the commencement, made a considerable and progressive advance; and during the fourth quarter of the first year attained a superiority in point of numbers over the average registration of baptisms," which, it is estimated by the Registrar-General, would have amounted to 111,147 quarterly in 1837-8. It is, on every account, greatly to be desired that the registration of births should be rendered complete; but this appears scarcely attainable, unless the Act of Registration shall be made compulsory.

The deaths registered in the year amounted to 335,956, to which must be added 2,704 deaths which occurred in the first year, and were registered in the first quarter of the second. This would make 338,660 deaths in the year, while according to former proportions, the probable number of burials entered in the parochial registers during the same period would be 291,715. Mr Finlayson, in a communication addressed to the Registrar-General, estimated the total deaths at home, in the year ending June 30th, 1838, at 335,968.

The following is an abstract of two tables, shewing the number of registered deaths of males and females at each age, and the relative proportion out of a thousand deaths dying in each period.

Similar tables are given for each of 25 divisions of the country, which have been made with reference, as far as possible, to the natural character of the several districts, and the employments of the population.

AGES.	Total Number of Deaths.			Relative Proportion out of 1000 Deaths.		
	Male.	Female	Total.	Male.	Female.	Total
Under 1 year*	39,990	31,898	71,888	234·66	193·72	214·54
1 & 2 years	21,672	21,219	42,891	127·17	128·85	128·
3 „ 4 „	8,108	8,147	16,255	47·57	49·47	48·51
From 5 to 9 „	7,821	7,619	15,440	45·89	46·27	46·07
10 „ 14 „	4,188	4,496	8,684	24·57	27·3	25·91
15 „ 19 „	5,276	6,172	11,448	30·96	37·48	34·16
20 „ 24 „	6,651	7,164	13,815	39·02	43·5	41·22
25 „ 29 „	5,966	6,582	12,548	35·	39·97	37·44
30 „ 34 „	5,633	6,162	11,795	33·05	37·42	35·2
35 „ 39 „	5,518	5,641	11,159	32·38	34·25	33·3
40 „ 44 „	5,609	5,383	10,992	32·91	32·69	32·8
45 „ 49 „	5,556	5,047	10,603	32·6	30·65	31·64
50 „ 54 „	5,474	5,073	10,547	32·12	30·8	31·47
55 „ 59 „	5,716	5,174	10,890	33·54	31·42	32·5
60 „ 64 „	6,905	6,692	13,597	40·51	40·64	40·57
65 „ 69 „	6,997	6,888	13,885	41·05	41·83	41·43
70 „ 74 „	7,320	7,403	14,723	42·95	44·95	43·83
75 „ 79 „	6,868	7,157	14,025	40·3	43·6	41·75
80 „ 84 „	5,189	5,746	10,935	30·48	34·81	32·63
85 „ 89 „	2,893	3,435	6,328	16·97	20·86	18·88
90 and upw.	1,068	1,566	2,634	6·26	9·51	7·86
Unknown . .	547	327	874	..	..	..
Total . .	170,965	164,991	335,956	1000·	1000·	1000·

* Excluding still-born children, who are not required to be registered.

From a very able report by Mr Farr upon the causes of death, it appears that, in the half year ending 31st December, 1837, the causes of death were assigned in 141,607 instances. The total deaths of males and females from each cause are given for England and Wales, and for each of 25 divisions of the country, and the annual mortality by each of 91 causes of death has been deduced from the facts registered. The proportion of deaths in 100,000 caused by each class of diseases in each division has also been calculated.

The following is an abstract of this information, the diseases being grouped together in a few classes according to their character:—

CLASSES OF DISEASES.	Total Number of Deaths distinguished.			Per-Centage Proportion of Deaths.		
	Male.	Female.	Total.	Male.	Female.	Total.
Epidemic, Endemic and Contagious	16,190	16,347	32,537	22·662	23·297	22·977
Sporadic, viz.—						
Nervous system .	11,729	10,123	21,852	16·418	14·427	15·431
Respiratory organs	18,925	19,597	38,522	26·490	27·929	27·203
Organs of circulation	902	694	1,596	1 263	·989	1·127
Digestive organs .	5,115	4,735	9,850	7·160	6·748	6·956
Urinary organs .	683	133	816	·956	·190	·576
Organs of generation	13	1,185	1,498	·018	2·117	1·058
Organs of locomotion	505	424	929	·707	·604	·656
Integumentary system	158	106	264	·221	·153	·187
Of uncertain seat .	7,942	8,265	16,207	11·117	11·779	11·445
Old age	5,674	7,017	12,691	7·942	10·000	8·962
Violent deaths . .	3,605	1,240	4,845	5 046	1·767	3·422
Total . . .	71,441	70,166	141,607	100·	100·	100·

The per-centage proportion of deaths by small pox, typhus, and phthisis, was as follows:—

	Males.	Females.	Total.
Small-pox,	4·262	3 935	4·104
Typhus,	6 213	6·567	6 389
Phthisis,	18·152	21·073	19·599

With respect to the principal diseases in the first class, it appears that 2,520 persons died of scarlatina, 3,044 of hooping-cough, 4,732 of measles, and 5,811 of small pox. The ages of 1,056 persons who died of small pox are enumerated, and the number under 5 years of age was 887. It is probable, therefore, that the majority of the 5,811 had never been vaccinated, and that about 12,000 die annually by small pox through the neglect of the parents.

The diseases of towns and of the open country are shown to differ very considerably both in character and intensity. The following is an abstract of two comparative tables of the diseases in cities and in counties.

The first comparison is between the 32 metropolitan unions and the five counties of Cornwall, Devon, Dorset, Somerset, and Wilts. The population of the former, according to the census of 1831, was 1,594,890, and of the latter 1,599,024. The rate of increase of the former, during the decennial period from 1821 to 1831, was 20 per cent.; that of the latter 12 per cent.: according to which, supposing the rate to remain constant, the population of the metropolis, on 1st October, 1837, would have been 1,790,451, and that of the counties 1,723,770. The area of the former is 70 square miles, and there are, therefore, 25,578 inhabitants to each square mile; while the area of the latter is 7,933 square miles, and the population 222 to each.

The second comparison is between the districts of Aston, Bath, Birmingham, Bristol, Cambridge, Carlisle, Clifton, Derby, Dudley, Exeter, Leeds, Leicester, Liverpool, Manchester, Maidstone, Newcastle-on-Tyne, Northampton, Nottingham, Salford, Sheffield, Stoke-on Trent, Sunderland, Wolverhampton, and West Derby, embracing all the principal towns in the kingdom, and the counties of Essex, Gloucester (exclusive of Bristol and Clifton), Hereford, Norfolk (exclusive of Norwich,) Suffolk, Sussex, and Westmoreland. The population of the former, in 1831, was 1,484,402, of the latter, 1,656,455. The rate of increase in the cities, from 1821 to 1831, was 31 per cent.; in the counties 11 per cent. Hence the population on the 1st October, 1837, might be estimated at 1,762,710 in the former, and 1,776,980 in the latter. The area of the cities was 677 square miles, with a population of 2,603 to each; and the area of the counties 9,312 square miles, with a population of 190 to each square mile.

CLASSES OF DISEASES.	First Comparison.		Second Comparison.	
	Metropolis.	Counties.	Cities.	Counties.
Epidemic, Endemic, and Contagious . . .	6,562	3,695	6,204	2,350
Sporadic, viz.—				
Of the Nervous system .	4,147	1,779	3,558	1,828
,, Respiratory organs	6,559	3,843	6,060	4,004
,, Organs of circulation	356	146	234	163
,, Digestive organs .	1,689	940	1,787	892
,, Urinary organs . .	111	75	108	66
,, Organs of generation	252	137	208	128
,, Organs of locomotion	150	71	112	83
,, Integumentary system	27	27	35	28
Of uncertain seat . . .	2,482	1,883	1,914	1,847
Old age	1,690	1,453	1,234	1,619
Violent deaths	580	524	790	405
Not specified	354	647	750	1,010
Total . . .	24,959	15,220	22,994	14,473

From these two tables it appears that the excess of mortality in the metropolis, compared with the five southern counties of England, is 64 per cent., or, in other words, that for every 100 persons who died in those counties, 164 died in the metropolis. The comparison of the other towns and counties is rather more favourable for the former, the proportion being as 100 to 158.

Among the diversities which especially demand attention, and by which there is least danger of being led to false conclusions, are those which relate to longevity, showing the varying proportions of deaths in old age in different portions of the kingdom. From a few instances of longevity no inference can be safely drawn; but the fact that of the deaths in any district, a comparatively large portion is above the age of 70, is a strong presumption in favour of the healthiness of that district. These proportions are found to vary greatly. In the whole of England and Wales, out of 1000 deaths, 145 have been at the age of 70 and upwards; while in the North Riding and northern part of the West Riding of Yorkshire, and in Durham, excluding the mining districts, the proportion has been as high as 210. In Northumberland, excluding the mining district, Cumberland, Westmoreland, and the north of Lancashire, the proportion has been 198; in Norfolk and Suffolk 196, in Devonshire 192, and in Cornwall 188. In contrast with this evidence of the large proportion of persons who attain to old age in these more thinly peopled portions of the kingdom, we find results extremely different where the population is densely congregated. In the metropolis and its suburbs the proportion who have died at 70 and upwards has been only 104; and even this proportion is favourable when compared with that of other large towns; the proportion in Birmingham being 81, in Leeds, 79, and in Liverpool and Manchester only about 63. A comparison of the mining parts of Staffordshire and Shropshire, and of Northumberland and Durham, with the rural districts surrounding each, exhibits great differences in this respect, the former averaging 109, and the latter 176. A very marked diversity also appears in the proportion of deaths of infants in different parts of the country. In the mining parts of Staffordshire and Shropshire, in Leeds and its suburbs, and in the counties of Cambridge and Huntingdon, and the lowest parts of Lincolnshire, the deaths of infants under one year have been more than 270 out of 1000 deaths at all ages; while in the northern counties of England, in Wiltshire, Dorset and Devon, in Herefordshire and Monmouthshire, and in Wales, the deaths at that age, out of 1000 of all ages have scarcely exceeded 180.

RELIEF CHURCH; a body of Scottish dissenters, ranking, as to numerical strength, next to the United Secession, and therefore standing second in the list of those dissenters who have withdrawn from the Church of Scotland.

Under the domination of a party who have not now the ascendant in the Scottish church, the General Assembly of 1752 appointed the presbytery of Dunfermline to meet at Inverkeithing, during the very time of the Assembly's sitting, to carry through a violent settlement in that parish. Every member of presbytery was enjoined, under pain of censure, to attend, and to appear before the Assembly on the day succeeding that of the appointed settlement, to give an account of their diligence, or to answer for their disobedience. The greater part of the presbytery did not attend, and thus the settlement did not proceed. The Assembly next day called the presbytery to account, and Mr Thomas Gillespie of Carnock, who was all along opposed to the settlement of ministers in reclaiming parishes, was deposed from the office of the ministry, while four of his co-presbyters were provisionally suspended. Upon this, Mr Gillespie proceeded to form at Dunfermline the first Relief congregation. A few years later, Mr Thomas Boston, son of the author of the 'Fourfold State,' voluntarily left his charge of the parish of Oxnam, and in the year 1757 erected a church in Jedburgh. These two ministers, along with Mr Collier, who afterwards deserted the Relief Church, formed themselves, a few years afterwards, into a presbytery. They called themselves the *Presbytery of Relief*, to intimate that they were willing to *relieve* from that which the great body of the Scottish nation have all along named the *yoke of patronage*. But this relief they professed themselves able to give only to those "who adhered to the constitution of the Church of Scotland, as exhibited in her creeds, canons, confessions, and forms of worship."

Since the constitution of the presbytery of Relief, this portion of Scottish dissenters has steadily continued to increase. For a considerable time, they occupied towards the Church of Scotland a position nearly analogous to that of the Wesleyan Methodists in England to the established church there. They professed no difference of opinion from the Scottish church, and cultivated intercommunion, so far as that was found practicable. But they have been lately withdrawing themselves to a greater distance from the church from which they originally sprung, and instead of having their candidates for the ministry educated at the Divinity Halls of the Universities, they have now a Hall of their own. They, however, require of their students the same attendance at all the classes in the university (theological ones excepted) which is required of candidates in the church of Scotland. In 1830, there were seventy-nine ministers connected with the Relief Synod, and in 1839, there were 112. The Relief is the only body of dissentients from the church of Scotland from which no branch dissent has sprung. As a church it still remains unbroken, but at the present time there is a union between it and the Secession church under proposition.

RENNIE, George; a distinguished agriculturist, was born at the farm of Phantassie, in the county of East Lothian, in 1749. His father, James Rennie, was one of the most active promoters of agricultural improvements in his day, and his brother John Rennie, was the celebrated civil engineer, of whom a short notice is given in the body of the work.

George Rennie very early exhibited indications of that activity, penetration, and intelligence, which characterized his after years. He has recorded of himself, that, while attending school, he used daily to pass through the workshop of Andrew Meikle, whose son was his companion, scrutinizing the machines and models from time to time passing under the hands of that indefatigable and ingenious man. He had an observant eye and a retentive memory; and in this way he gained some mechanical knowledge, and, what was of more advantage, an impetus was given to inquiry, and a turn for the investigation of such new inventions or improvements in the arts as came, from time to time, afterwards to be objects of public consideration and importance. When a youth, he was sent to Tweedside by his father, to make a survey of the state of agriculture in those districts, and his attention was there powerfully directed to the commencement of a system of extensive improvement of their own estates by several gentlemen, the fathers of agricultural improvement in the south-east border counties,—such were lord Kaimes, Hume of Ninewells, Renton of Lammerton, Fordyce of Ayton, and others. These improvements, which consisted principally of enclosing, marling on a great scale, and draining, appear to have commenced so far back as 1750. James Rennie having died in 1766, when, consequently, the subject of our memoir was only seventeen years of age, the journey must have been undertaken anterior to that period, and proves, not only his general powers of observation, but his father's discernment, in having appreciated the qualities for which his son was afterwards to be distinguished. James Rennie having erected a brewing establishment on the ground now occupied by the Linton distillery, the superintendence of it was, in 1765, committed to George. In this charge he continued for one year, at which time the death of his father occurring, the establishment was relinquished, and allowed to remain in a dormant state until the year 1770, when it was let to a tenant. In 1783 Mr Rennie again took the works into his own management; and, having fitted them up in a superior manner, commenced the business of distilling on an enlarged scale. The distillery remained in Mr Rennie's hands until 1797, when the whole work was let in lease.

The success of Mr Rennie as an agriculturist soon came to be very generally known; and the accurate arrangements of his farm were a theme of praise, as well as an incentive to emulation, among the most discerning of his neighbours. Considering agriculture as fundamentally a practical science, facts and actual experiments were the data on which he went, sparing neither trouble nor expence in setting to rest a variety of speculative opinions. His keen perception and scrutinizing judgment taught him, almost intuitively, the fallacy of a number of these; and others, which had some real grounds for their support, but which had been rendered by time and error too abstruse or complicated, he freed from the needless leaven encumbering their operation, and thus simplified and established. Above all, he taught, by the admirable way in which his lands were laid out and kept, that farming requires the quick eye and the unremitting hand, and that its general principles, though subject to the operation of soil and climate, are regulated by intelligence and calculation. His property was completely fenced, thoroughly drained, well manured, and most perfectly cleaned of every kind of annual weed. This was effected by drilled crops, which were horse-hoed, hand-hoed, and thereafter, if necessary, hand-picked. In short, his whole operations were conducted in such a masterly style, and the culture of his farm in every respect so perfect, that it was not only vastly increased in productive value, but had the appearance of a well kept garden.

At the earlier periods of Mr Rennie's life, the custom of dividing farm grounds into the distinction of "infield" and "outfield," had not become entirely obsolete,—the former being the only portion which was manured, and which, from being constantly under tillage, was full of all sorts of weeds, annual and perennial; and the latter never receiving manure at all, except what it casually obtained in the depasturing of cattle, and consequently, scarcely repaying the trouble and expense of cultivation. In these times, also, a great part of East Lothian was held by the tenants under old leases, some of whom paid rent wholly in grain, and others partly in grain and partly in money, and nearly all were burthened with restrictions of thirlage to particular mills, and payments in kind. Farms were only beginning to be extended in size to the more modern scale, and the average might be about two hundred acres, although many were smaller, and few reached the length of three hundred. These required from three to four ploughs, which were each worked by four horses. At the present time, many of the farms exceed five hundred acres in extent, and are worked by eight or ten ploughs; and the natural consequence of such enlargements has been a diminution of the number of farmers by more than one-fourth. According to lord Kaimes, in his Gentleman Farmer, the usual rotation of crops at that time, upon the best infield land, was fallow, wheat, barley, oats, peas, wheat, barley, oats; while, upon inferior soils, a less scourging succession was practised. The method adopted in gathering in the harvest was also imperfect. From the reapers being hired for the season at fixed wages, it became their object, as they supposed it their interest, to hurry through matters, without much regard to the accuracy of their operations; the consequence of which was, that the grain was most imperfectly and very irregularly cut. From most of the farm-servants being employed at the same work, it was afterwards allowed to remain in the fields, until the whole reaping process was finished, at which time the stacks were more expeditiously than compactly built,—were far too many in number, and were often left for a considerable time destitute of covering. As to the in-door management, little need be said of the immense improvement which the invention of the thrashing-machine necessarily brought along with it, and which can only be duly estimated by those who remember the time and toil which were expended in manual labour. Indeed, taken all in all, the business of thrashing was one of the most troublesome connected, in former days, with the operations of a corn farm, and even then without the most irksome surveillance of the people employed, it was never perfectly performed. The winnowing, or cleaning of the grain, was also another everlasting process, the very remembrance of whose difficulties is enough to sanctify the memory of the man who invented a method for their cure. The old heavy Scotch plough was in general use, and few farmers were possessed either of rollers or drilling-machines. This cumbrous ploughing instrument came at length to be superseded by one of a smaller construction, something on the Dutch model, and resembling the Rotherham one; and both at last were exploded, on the introduction of the lighter and improved one of Mr Small.

In 1787 Mr Meikle having invented the Drum Thrashing Machine, one of the most important and beneficial discoveries which the agricultural art owes to mechanical genius, Mr Rennie, with the generous enthusiasm which characterized him, immediately exerted himself in behalf of the unassuming, but most indefatigable and meritorious discoverer, and caused him to erect the first machine in the county, worked with horses, on the Phantassie property, the only previous one being that of the inventor himself, at Knowsmill, near Tyningham, which was impelled by water. The merit of the discovery of the thrashing-machine by Andrew Meikle, like the discoveries of Bacon, Harvey, Watt, Davy, and other great and fortunate names, was, after his death, disputed, and by various people. Most of these claims were easily disposed of; but by the friends of the late Sir Francis Kinloch, a more serious and determined opposition was set up, it being contended for by them, that Mr Meikle's machine was copied and imitated from a model sent by Sir Francis to Mr Meikle, at Houston Mill, in 1784. In a letter, originally inserted in a pamphlet published by Mr Sheriff, entitled a "Reply to an Address to the Public, but more particularly to the Landed Interest of Great Britain and Ireland, on the subject of the Thrashing-Machine," and afterwards copied by the conductor into the forty-eighth number ot the Farmer's Magazine, Mr Rennie came forward as the defender of his venerable friend, who was then between eighty and ninety years of age; and therein gave such a lucid, well-arranged, and unanswerable statement of the historical facts relating to the discovery, so far as the claims of Sir Francis Kinloch and Mr Meikle were respectively concerned, that he may be said to have for ever settled the controversy. From his temperance and regularity, Mr Rennie kept himself in the possession of general good health, although his constitution was not naturally a very strong one; as, in early youth, he was subject to hæmoptysis, and pectoral complaints, after either severe exertion, or exposure to cold. Probably the precautions and restrictions which these threatenings subjected him to, however seemingly the harbingers of evil, operated in every respect beneficially, as they not only tended to the formation of habits which led to the prolongation of life, but to give a peculiar stamp to the character of the man. Although no anchorite, when the conviviality of the occasion required, the habitual course of his living was abstemious. He went early to bed, and, until bodily infirmities began to creep upon him a few years before his death, was an early riser, and fond of morning exercise. He died on the 6th October, 1828. In personal appearance he was slender, and never, even in his better years, exhibited any tendency towards corpulency, a circumstance which probably in a great measure originated in the activity of his mental and corporeal habits. In stature he appeared to be six feet, was dark haired, with a quick eye, and striking countenance. In a moral point of view, and in all the relations of life, his character was highly estimable. As a parent he was affectionate and kind; as a friend, sincere and attached; as a man of business, open, punctual, and accurate. In the forwarding of others, he spared neither time, trouble, nor expense; and he needed only to have merit pointed out to him, that he might exert himself in its behalf. He was not fond of attracting notice, either by speaking in public, or by writing; but the few articles he published exhibit an ability and luminousness greatly beyond the reach of ordinary minds.

ROPE MAKING. A single thread of yarn, consisting of fibres twisted together, has a tendency to untwist itself, the external parts being strained by extension, and the internal parts by compression; so that the elasticity of all the parts resists, and tends to restore the thread to its natural state. But if two such threads similarly twisted, are retained in contact at a given point of the circumference of each, this point is rendered stationary by the opposition of the equal forces acting in contrary directions, and becomes the centre, round which both threads are carried by the forces which remain; so that they continue to twist round each other, till the new combination causes a tension, capable of counterbalancing the remaining tension of the original threads. Three, four, or more threads, may be united nearly in the same manner. A *strand*, as it is called by rope makers, consists of a considerable number of yarns thus twisted together, generally from sixteen to twenty-five; a *halser* consists of three strands, a *shroud* of four, and a *cable* of three halsers or shrouds. Shroud laid cordage has the disadvantage of being hollow in the centre, or else of requiring a great change of form in the strands to fill up the vacuity; so that in undergoing this change, the cordage stretches, and is unequally strained. The relative position and the comparative tension of all the fibres in these complicated combinations are not very easily determined by calculation; but it is found by experience to be most advantageous for the strength of ropes, to twist the strands, when they are to be compounded, in such a direction as to untwist the yarns of which they are formed; that is, to increase the twist of the strands themselves; and probably the greatest strength is obtained when the ultimate obliquity of the constituent fibres is least, and the most equable.

A very strong rope may also be made by twisting five or six strands round a seventh, as an axis. In this case, the central strand, or heart, is found after much use to be chafed to oakum. Such ropes are, however, considered unfit for rigging, or for any use in which they are liable to be frequently bent

Ropes are most commonly made of hemp, but various other vegetables are occasionally employed. The Chinese even use woody fibres; and the barks of trees furnish cordage to other nations.

The first part of the process of rope making by hand, is that of spinning the yarns or threads, which is done in a manner analogous to that of ordinary spinning. The spinner carries a bundle of dressed hemp round his waist; the two ends of the bundle being assembled in front. Having drawn out a proper number of fibres with his hand, he twists them with his fingers, and fixing this twisted part to the hook of a whirl, which is driven by a wheel put in motion by an assistant, he walks backwards down the rope-walk, the twisted part always serving to draw out more fibres from the bundle round his waist, as in the flax-spinning wheel. The spinner takes care that these fibres are equably supplied, and that they always enter the twisted parts by their ends, and never by their middle. As soon as he has reached the termination of the walk, a second spinner takes the yarn off the whirl, and gives it to another person to put upon a reel, while he himself attaches his own hemp to the whirl hook, and proceeds down the walk. When the person at the reel begins to turn, the first spinner, who has completed his yarn, holds it firmly at the end, and advances slowly up the walk, while the reel is turning, keeping it equally tight all the way, till he reaches the reel, where he waits till the second spinner takes his yarn off the whirl hook, and joins it to the end of that of the first spinner, in order that it may follow it on the reel.

The next part of the process previous to tarring, is that of warping the yarns, or stretching them all to one length, which is about 200 fathoms in full-length rope-grounds, and also in putting a slight turn or twist into them.

The third process in rope making, is the tarring of the yarn. Sometimes the yarns are made to wind off one reel, and, having passed through a vessel of hot tar, are wound upon another, the superfluous tar being removed by causing the yarn to pass through a hole surrounded with spongy oakum; but the ordinary method is to tar it in skains or hanks, which are drawn by a capstan with a uniform motion through the tar-kettle. In this process, great care must be taken that the tar is boiling neither too fast nor too slow. Yarn for cables requires more tar than for hawser-laid ropes; and for standing and running rigging, it requires to be merely well covered. Tarred cordage has been found to be weaker than what is untarred, when it is new; but the tarred rope is not so easily injured by immersion in water.

The last part of the process of rope making, is to lay the cordage. For this purpose two or more yarns are attached at one end to a hook. The hook is then turned the contrary way from the twist of the individual yarn, and thus forms what is called a strand. Three strands, sometimes four, besides a central one, are then stretched at length, and attached at one end to three contiguous but separate hooks, but at the other end to a single hook; and the process of combining them together, which is effected by turning the single hook in a direction contrary to that of the other three, consists in so regulating the progress of the twists of the strands round their common axis, that the three strands receive separately at their opposite ends just as much twist as is taken out of them by their twisting the contrary way, in the process of combination.

Large ropes are distinguished into two main classes, the *cable laid* and *hawser-laid*. The former are composed of nine strands, namely, three great strands, each of these consisting of three smaller secondary strands, which are individually formed with an equal number of primitive yarns. A cable-laid rope eight inches in circumference is made up of 333 yarns or threads, equally divided among the nine secondary strands. A *hawser-laid* rope consists of only three strands, each composed of a number of primitive yarns, proportioned to the size of the rope; for example, if it be eight inches in circumference, it may have 414 yarns, equally divided among three strands. Thirty fathoms of yarn are reckoned equivalent in length to eighteen fathoms of rope cable-laid, and to twenty fathoms hawser-laid. Ropes of from one inch to two inches and a half in circumference are usually hawser-laid; of from three to ten inches, are either hawser or cable laid; but when more than ten inches, they are always cable-laid.

Every hand-spinner in the dock-yard is required to spin, out of the best hemp, six threads, each 160 fathoms long, for a quarter of a day's work. A hawl of yarn, in the warping process, contains 336 threads.

The following are captain Huddart's improved principles of the rope manufacture:—

1. To keep the yarns separate from each other, and to draw them from bobbins revolving upon skewers, so as to maintain the twist while the strand or primary cord is forming.

2. To pass them through a register, which divides them by circular shells of holes; the number in each concave shell being conformable to the distance from the centre of the strand, and the angle which the yarns make with a line parallel to it, and which gives them a proper position to enter.

3. To employ a tube for compressing the strand, and preserving the cylindrical figure of its surface.

4. To use a guage for determining the angle which the yarns in the outside shell make with a line parallel to the centre of the strand, when registering; because according to the angle made by the yarns in this shell, the relative length of all the yarns in the strand will be determined.

5. To harden up the strand, and thereby increase the angle in the outside shell; which compensates for the stretching of the yarns, and the compression of the strands.

A great many patents have been obtained, and worked with various degrees of success, for making ropes. We shall confine ourselves here to a description of two machines, figured in Plate LXXIV., the one for making rope yarns, the other for sewing flat-ropes; invented by Mr James Whitelaw, and fitted up by him in one of the most extensive rope-works in Glasgow.

Twisting Machine.—Fig. 1 is a front elevation of the machine for making rope yarns. This machine is set in motion, or stopped, by means of a belt which works upon the fast and loose pulleys *a a*. The main driving shaft *b b*, runs the whole length of the framing of the machine and beyond its ends. Upon the shaft *b b*, the bevel-wheels *c*, *c*, *c*, are fixed; and these wheels give motion to the frames which hold the cans *d*, *d*, *d*, by gearing into other wheels fixed to the under ends of the frames. The pulley *e*, upon the main shaft, sets in motion the pulley *f*, by means of a belt passing over each; and the pulley *f* runs loose upon the spindle of the rollars *g g*, and carries a teethed pinion, *h*, round with it. The pinion *h*, gears into a wheel *i*, fixed on the end of the spindle of the rollars *k*, *k*; and in this way, it communicates motion to the top drawing-rollers. Upon the other end of the spindle of the rollers *k*, *k*, the spur wheel *l* is fixed, which gears into the spur wheel *m*, fastened upon the end of the spindle of the rollers *g*, *g*; and in this way these rollers are set in motion. The teeth are not shown in any of the wheels. If the cans had been made of a smaller size than they are shown in the figure it is supposed that this would have been an improvement.

The mode of operation of the machine is as follows. The cans *d*,*d*,*d*, are first put into frames, (with very large holes at the top) similar to those shown in the fig., which run in front of the ordinary kind of drawing frame, and a large portion of twist is thus put into the sliver whilst the cans are filling. When the cans are filled at the drawing-frame in the way mentioned, they are lifted from it, and set into the frames of the machine shown in the fig., after each end of the half-formed rope-yarn has been passed through a hole made for the purpose, in the top part of its can-frame. When the cans are thus put into their frames, the end of each yarn is first passed over the top rollers *k*,*k*, then under the rollers *g*,*g*, and again over the top rollers, and under the bottom ones, after the manner of a crossed belt; then the ends are passed betwixt each pair of back guide-rollers *n*,*n*, and from them to a reel. As soon as all this is done, the machine is set a going, and the rest of the twist is put into the yarns, by the cans revolving, whilst the draw-rollers are taking them out, and passing them on to the reel; the surface of which moves at the very same speed as the surface of the rollers *g*,*g*, and *k*,*k*.

Above the top journal of each can frame a nipper is fixed, which revolves along with it. Each nipper is composed of two pieces of hardened steel, which work in a mortice cut through the cylindrical part fixed above the top journal of each can frame. These steel pieces bear upon each other at their inner ends; each of which has a semicircular groove running up and down in it, sufficiently large to hold the yarn fast, so as to press and smooth it, whilst passing through the nippers. An oval spring *o*,*o*, presses each pair of steel pieces together, and every spring has a pinching-screw, which is not seen in the fig., to regulate the strain. One of the cans is shown in section, and there is a small ring or eye for the yarn to pass through, fixed inside of each can, at the top, which eye is shown in this can. Next to the sectioned can, one is drawn showing the edge of its frame, and also the manner of holding the cans, and how they may be taken out or put into their frames. Upon the top of the last mentioned frame, one end of the steel pieces of the nippers is shown. The top drawing rollers have grooves cut into them, in order to guide the yarns; and the two pulleys *p* and *q*, which drive the reel, form part of these rollers. The pulleys *p* and *q*, have the one an open, the other a crossed belt, and there is a double clutch-box with suitable pulleys, upon an intermediate shaft; which shaft is in two pieces, and by this arrangement the reel is set in motion, stopped, or reversed. The axes of the top and bottom draw-rollers are not in the same perpendicular plane, but the top rollers overhang the bottom ones, in order to prevent the yarn when passing from the nippers on to the top draw-rollers, from coming in contact with the turns of the yarn upon the under draw-rollers. If the machine is working so as to put fore twist into the yarn, it can be altered to put back twist into it, very easily, by simply opening the cross belts, or belt, and crossing the belts or belt, which is open, upon the pulleys *a*, *a*, *e*, and *f*.

If instead of cans, bobbins filled by an ordinary roving-frame, were put into the above machine, with the spindle of each lying in a horizontal direction, the additional twist would in this way be given to the yarn, if the machine was adjusted, and set in motion in the way already described.

Machine for Sewing Flat-ropes. Fig. 2. is an elevation with one of the driving pulleys, &c. for the needles taken away, and fig. 3, is a plan of this machine:—when a part is seen in both figs., the same letters point it out in the one as in the other. The crane shown at A, draws the ropes to be sewed forwards, by the assistance of a set of blocks and tackle, made fast on the different side of the crane, from the sewing part of the machine. *a*, is its driving pulley, which is worked by a belt in the ordinary way. The crane part of the machine is stopped or set in motion by a handle *b*, which works the plate *c*, by means of the arrangement of shafts, rods, and levers, shown in the figs. A, pin upon the plate *c*, gears into a gab or snug on a friction strap, screwed upon the arms of the driving pulley; and this forms the connecting and disconnecting parts of the clutch-box. The crane is of the ordinary construction, and the teeth upon its wheel *d*, and pinion *e*, are not shown. The pulleys *f,f*, turn the spindles *g,g*, by means of a feather which holds into a very long groove cut into each spindle. The spindles *g,g*, are screwed, and the screwed part of each works into a nut, (made in two pieces, so that it may be tightened up if it wears,) in order that when a spindle is turned by means of its pulley, it will, by the feathers sliding into the groove, work the needle on end, as well as turn it round. *h* is a handle in connection with a screw, which works a wedge in such a way, as that it will raise or lower the under plate which presses and guides the ropes to be sewed. When a needle is set in motion, it should pass through the ropes and come out again before it stops; this is done by means of two bevel wheels, upon each of the shafts which move the pulleys that drive the pulleys *f, f*. Say that these wheels run loose upon the shafts, with the face of the one wheel opposite the face of the other; and that each has a friction-cone cast on it; then, if these wheels are kept always moving, by means of a third bevel wheel which gears into each pair, and if a double-ended cone be coupled to its shaft in such a manner as that it can be pushed into the one or the other of the cones upon the wheels; the shaft, and consequently the needles, will be worked backwards or forwards, according as the double cone is pressed into the cone of the one bevel wheel or the other. A weight fastened on to a lever, and working above a horizontal rocking-shaft, is the simplest method of holding the cones into gear; and all the parts necessary besides this, are required to shift the cones quickly out of gear, when the needles come out; but when a needle is as far into the ropes as it can get, then the parts must be adapted to each other, so that the double cone will be shifted from the cone on the one wheel into that of the other. The bell-crank levers *i,i*, worked in the manner shown in fig. 3, are for the purpose of shifting the double-cones. Each part on the outer ends of the spindles *g,g*, for working the bell-crank levers, is fitted, so that the spindle may turn into it when it is carried end ways with the spindle; *k*, in the elevation, is one of the rods which carry the motions of the bell-crank levers to the double-cones.

RUGBY, (anciently *Rocheberrie*,) a small town of England, in Warwickshire, situated on the south side of the river Avon, eighty-three miles N. W. from London. There are no manufactures carried on in the town, and the inhabitants of the vicinity are chiefly engaged in agriculture. Population in 1841, 4008. Rugby is only noted on account of its free grammar school, an institution which owes its foundation to Laurence Sheriffe, a citizen of London, in the early part of the reign of Elizabeth. He was a native of Brownsover, a village in the neighbouring parish of Clifton; and he endowed the school with property in that parish, and with about eight acres of land in London, called Conduit close, and now forming a part of Lamb's Conduit street and its vicinity. The metropolitan portion of the endowment has increased in value so wonderfully within the last half century, that the revenues of the school have advanced during that period from £116 a year to more than £5000. The management of the institution is vested in twelve trustees, and the school is under the direction of a head master, with six assistant classical masters, a French teacher, a writing master, and a drawing master. There are about forty boys on the foundation; and the number of those not on the foundation is restricted to 260. Twenty-one scholarships or exhibitions of £60 a year each, at either Oxford or Cambridge, are open to the scholars of this seminary; and there are likewise several university fellowships, to which the master and assistants are entitled on retiring from the school after ten years' service. The buildings belonging to this noble institution were re-erected in 1808, forming a handsome group in the Tudor style of architecture.

RUNJEET SINGH. See *Lahore*.

RUSSIA, (*a*.) The population of Russia amounted in 1836, to 61,000,000. Of this number, the peasantry amounted to about 45,000,000, nearly one-half of whom "belonged" to the crown, and the remainder to the nobles. The value of an estate is estimated by the number of "souls," that is, *male* peasants of all ages, which are upon it. On the estate of count Cheremetief, the largest landowner in Russia, the number of his "souls," to use the ordinary phrase, amounts to 110,000. In the interesting "Details of Russian Husbandry," contained in a recent work on Russia, by Mr Venables, and which was supplied to him by his relative M. de Sabouroff, in the government of Tambow, we learn that 200 souls are usually reckoned to furnish eighty labourers, women and men, for the wives toil as well as their husbands. These work three days in the week for their master, who gives up to them in return the half of his land. A day's labour of a man includes that of his wife and his horse when requisite; and a peasant cannot change his employment nor move from home without his master's leave. To a village containing 200 souls the proportion of productive land allotted to the peasantry is about 2000 acres. A married couple have usually two acres devoted to a regular corn crop, two to a spring crop, two are in fallow, and they have generally an acre of meadow and an acre of pasture land, with a house, outbuildings, and garden. Instead of paying rent, they cultivate an equal quantity of land on the domain of their lord.

During the long Russian winter there is little or no demand for the labours of husbandry; but as labour of any kind, although in a great degree it may be wasted or misdirected, brings nevertheless some return to the landowner or peasant-owner, as he may be called, he employs the serfs in his factory until the season for field labour again returns. Mr Venables states that "there are few landed proprietors who do not carry on a manufactory of some kind or other." He further informs us that "not only have the Russian nobles, from the nature of their property and the constitution of their country, become manufacturers, but they carry on the business in every branch almost entirely to the exclusion of other classes, since they alone can command without difficulty, and on advantageous terms, the hands necessary for the purpose. A manufacturer who is not noble, being incapable by law of possessing serfs, while free labour is scarce, must compete at a disadvantage with a rival who can enforce the performance of whatever work he requires, and who has his operatives as it were under military discipline." The Russian peasant manifests an extraordinary aptitude for the varied labours which he is required to perform. "He will plough to-day, weave to-morrow, and help to build a house the third day." Many travellers have concurred in praising the handiness and ingenuity of the peasantry.

In addition to the work carried on in factories, there is a great amount of industry engaged in household manufactures. These afford employment during the winter, and also at other times, as they may be suspended or resumed at convenience. Mr Venables tells us that "the exercise of various arts on a small scale in private houses, either for profit or home consumption, is very great." "Many ladies employ a number, generally the children of household servants, in embroidering and making all kinds of fancy-work." "Women are employed in spinning, weaving, knitting, carpet-weaving, &c., for the raw material in Russia is worth little, and the manufactured article alone is valuable in the market." Almost all travellers in Russia speak in terms of praise of the industry of the peasants' wives; and the same causes which lead the richer classes to employ their dependents in giving value to an article by the skilful labours of the needle, direct the female peasants to the means of increasing their humble comforts at a small expense, while time is profitably filled up for which there is no other demand. Captain Cochrane, the pedestrian tourist, says:—"The women (wives of the peasantry) I have always found engaged in some employment: they make very good coarse woollen cloths and linens, as well as knit stockings and spin thread. The whole work of the house is thrown upon them, while they also partake the labours of the field." In the towns and villages on the banks of the Kolyma, in Eastern Siberia, "the women embroider gloves, caps, boots, and various things, in a very neat manner."

There can be no doubt, therefore, that Russia manufactures for her own consumption an immense quantity of cotton, linen, and woollen goods. The government makes great exertions to encourage home manufactures, and its agents abroad are directed to forward models of all new machinery and patterns of new manufactures to St Petersburg, and foreign workmen are not unfrequently engaged by them to conduct Russian factories. Within the last few years great efforts have been made to improve the quantity and quality of Russian wool. The Merino sheep has been successfully naturalised, not only in the central and southern governments, but in Esthonia and Livonia, on the shores of the Baltic, where, though nature has done less, the great care which is necessary in the management of a sheep-fold has occasioned the improvement of wool to be equally if not more rapid than in more favoured provinces. In 1832, a society for the improvement of wool was formed in Siberia. The first Merino sheep were introduced into the Russian empire less than thirty years since, and there are now about a million in the government of Jekaterinoslaw, and in the Crimea and the government of Cherson probably by this time nearly as many. In 1826 the exports of wool from Russia amounted to 35,800 poods; in 1834 to 281,450 poods. The purchase of Russian wool for the English manufacturer has greatly increased within the last few years, the imports of wool from Russia in 1820 having been 75,614 lbs., and in 1838 3,769,102 lbs. Our exports of woollen goods have decreased, being valued at £346,331 in 1820, and at £94,419 in 1838. The raw material in Russia has not only increased in quantity and value, but the increase has been accompanied by greater facilities in working it up for home consumption. It is only within the last twenty-eight years that factories on a large scale have been established. From 1822 to 1830 the quantity of cloth manufactured had increased from 6½ to 8 millions "arskeens;" and in the latter year two-fifths were of coarse quality, for the use of the army, two-fifths of middling, and one-fifth of fine quality.

Since 1824 the cotton manufacture has made rapid progress, as may be inferred from the following facts:—

Cotton yarn and twist exported to Russia from the United Kingdom:—

1820 - - -	8,762,324 lbs.
1830 - - - -	18,555,753
1837 - - -	24,108,593

Cotton goods exported to Russia:—

		1820.	1837.
White or plain cottons	yards	9,754,460	980,779
Printed or dyed cottous	—	3,449,391	145,760
		13,203,851	1,126,539

In 1835 new cotton-spinning establishments were formed at St Petersburg, Moscow, and Kalouga.

Great efforts have been made to establish the silk manufacture, and especially to produce the raw material. The mulberry-tree is grown as far north as the governments of Minsk, Poltawa, and Mohilew, and southward to the base of the Caucasus. Near all the principal towns of the south, large plantations of mulberry-trees have been planted within the last few years. In the government of Charkoff, particularly, 15,000 trees are planted every year at the expense of the crown, and valuable privileges are in all cases afforded to those who embark their capital in the production of silk.

We have not the means of ascertaining the progress of manufactures in hardware and cutlery, but the advance which has been made in this branch has not been so great as in the cotton, silk, and cloth manufactures. In 1832 we exported 4596 cwts. of hardwares and cutlery to Russia, valued at £27,619; and in 1838 7082 cwts., valued at £36,830. Russia annually imports edge tools and scythes from Austria of the value of £80,000. In 1835 a manufactory of surgical instruments at St Petersburg furnished the army and the public departments with instruments of the value of 184,000 roubles. In the same year a company was established at St Petersburg for the manufacture of plated goods. The total number of manufacturing concerns in the empire in 1835 was 6045, of which 381 were established in that year. Mines, forges, and furnaces are not included in this enumeration.

In the St Petersburg Agricultural Gazette, an article is given on the varieties of climate and productions in the Russian empire, which has been translated by Mr James Heard. The author, who is said to be an eminent Russian statesman, divides Russia into the following climatic regions. 1st, The region of ice. 2nd, The region of moss. 3d, The region of forests and pasturage. 4th, The region of barley, and the beginning of agriculture. 5th, The region of rye and flax, or of settled agriculture. 6th, The region of wheat and fruit. 7th, The region of maize and the vine. 8th, The region of the olive-tree, the silk-worm, and the sugar-cane.

In adopting this division of climatic regions, it must be remembered, that they do not run exactly parallel to the equator, but decline to the south, in proportion as they extend eastward, without noticing those more minute varieties of temperature produced by accidental causes, which carry these imaginary boundaries sometimes more to the south, at others more to the north, as, for instance, on the summits of the Ural Mountains, where the cold is severe, or in some sheltered spots on the rich soil of the government of Vologda, where it is unnaturally genial.

1. *The region of Ice.*—The icy region may be considered as including Novaya Zemlia,[*] part of the Kolskaya district, and the extreme northern points of land which project into the Frozen Ocean. This region is distinguished by a night of three months' duration, and its total destitution of vegetable productions, which circumstances render it unfit for the permanent habitation of man and domestic animals. The seal, the walrus, and fish of various descriptions which abound towards the pole, supply the only means of sustenance for man, the polar bear, and its inseparable companion the fox; except on Novaya Zemlia, where multitudes of a peculiar kind of mice breed, and lay up heaps of roots for their winter store. These mice serve, in their turn, as food for the bears and foxes.

The maritime enterprizes undertaken by the commercial house of Brandt in Archangel, may probably furnish us with more authentic information concerning these parts. They have been conducted with as much courage as perseverance, and although the profits arising from them may in some measure supply the place of agriculture, yet they cannot be said in any way to be connected with it.

2. *The Mossy Region*,—where the ever-frozen ground is covered with a kind of grayish moss, and towards the boundaries of the following region, with a kind of dwarf brush-wood and fir. This tract is endowed by nature with an animal that alone makes it habitable for man, the rein-deer. Its vast deserts stretch from Archangel, along the shores of the White Sea to the Eastern Ocean, peopled by thinly scattered nomadic tribes of Laplanders, Samoyades, Ostiaks, and other aborigines, whose numbers are gradually decreasing as they come in contact with civilized nations. Besides the resources derived from the milk and flesh of the rein-deer, a considerable portion of the population is supported by fish.[†] The chase of marine animals, and such as furnish valuable furs, affords the principal employment of the inhabitants. Besides which, innumerable flocks of swans, wild geese, and other aquatic birds of passage, visit them during their short summer, and form an important part of their sustenance. Lastly, in this region, adjacent to the Frozen Ocean, at the mouth of great rivers, and near certain islands, are found those astonishing remains of antediluvian animals, particularly of the mammoth, and here was discovered that enigma for naturalists, the bones of one of those monsters, still covered with flesh and skin.

3. *The Region of Forests and Pasturage.*—By degrees the dwarf trees and brushwood of the mossy region increase in size, until we come to those immense forests, where the hand of man has not yet disturbed the majestic operations of nature. Along the banks of the rivers, and in other spots unincumbered with wood, the grass shoots up with astonishing rapidity; but the lingering frosts of spring, and the early appearance of those of autumn, prevent the cultivation of corn. For this reason the inhabitants of the northern part of this district, are principally occupied with the chase, especially that of the squirrel, an animal that seems to be indigenous there, and which forms the principal inducement for man to take up his abode in this inhospitable clime. The abundance of grass in the southern part affords the means of keeping cattle, while in some sheltered spots appear a few cornfields, as it were, the outposts of agriculture. The northern and eastern parts of this region are inhabited by nomadic tribes, then follow the Finns or Finlanders, a settled people chiefly dependent on pasturage for support. It would be difficult to mark with precision the southern boundaries of this region, as it falls gradually into the next.

4. *The Region of Barley, and the beginning of Agriculture.*—On account of the shortness of the summer, and the early autumnal frosts, barley is the only grain successfully cultivated here, but, with great care, several kinds of vegetables may be brought to maturity, and possibly potatoes might thrive. The inhabitants are Russians, Finns, Zirians, and others having settled habitations; but from the insignificance of their agriculture, they have recourse to grazing, fishing, and the chase, floating of timber, &c. In some parts, however, of the governments of Archangel and Vologda, are to be found a very superior breed of horned cattle. The southern limits of this region may be said to extend nearly to the town of Yarensk in the government of Vologda, and the parts of a corresponding degree of latitude, viz. the 63°. Nature here assumes an imposing aspect; immense forests, vast rivers, beautiful meadows, flourishing in all the unexhausted luxuriance of primitive vegetation, make an impression on the traveller that can only be adequately conceived by those who have wandered through the unexplored forests and beheld the majestic streams of the New World.

5. *The Region of Rye and Flax, or of settled Agriculture*,—extends from the limits of the former, southward to the middle of the government of Tchernigov, or to the 51st degree of northern latitude, and the districts on the corresponding line to the eastward. It would be superfluous to enter into a minute description of this vast region, which comprises the principal part of the Russian empire; we shall therefore content ourselves with a few partial observations. It will readily be conceived, that the southern part has some advantages

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[*] Or the New Land, incorrectly marked on the English globes and maps *Nova Zembla.*

[†] To counteract the ravages of the scurvy the inhabitants employ a kind of cochlearia.

over the northern, although they are not of such a striking nature as to demand a separation; it may even be said these advantages are more than counterbalanced by other unpropitious circumstances, which concur to depress agriculture, especially in Baylo Rossia (White Russia.) The difference between the western and eastern extremities of this region is very striking. The climate of Moscow may be called the medium, or real Russian climate, and is exceedingly favourable for all agricultural pursuits. Towards Siberia the seasons are much more inclement; while to the westward, beyond the Dneiper and Dwina, they are so mild, that about Grodno and Baylostock plums and pears grow in the open air. Under favourable circumstances, and by means of gradual naturalization to the climate, we meet with fruits even in the northern part of this region, especially apples; but even they require great care, and sometimes the trees are destroyed by the frost. The provinces situated on the Baltic, besides occupying the extreme west, are favoured by the vicinity of the sea; their climate is therefore the mildest of any in this region on similar degrees of latitude. The European part, forming one immense plain but little diversified by hills of any considerable elevation; the local difference of climate is not considerable, and arises chiefly from the forests, bogs, and the nature of the soil. Agriculture in in this region is almost, without exception, conducted on the most primitive and unimproved plan, called the *trekpolnia*, or three-field system, especially in the original Russian provinces, where we scarcely meet with any examples of the improved methods, except here and there by way of trial, or as a kind of rural luxury on the part of the proprietor; while, in the Baltic provinces, considerable progress has been made in introducing a proper rotation of crops, and in general the modern improvements in agriculture. The breeding of cattle has likewise remained in its original imperfect state, without any improvement, and existing only as a kind of indispensable appendage to husbandry. An improved system of forest management is even more necessary than an improved system of agriculture, although the latter would doubtless greatly contribute to introduce the former, for, under proper management, much less meadow and arable land would be necessary to produce a given quantity of corn and hay, and the forests would no longer be destroyed merely for the purpose of procuring a piece of fresh land. The distinguishing feature of this region is vast and convenient water communication, without which the useful products of the inland districts would scarcely find their way to any market; by their means the single article of tallow is exported to the amount of forty millions of roubles annually.

6. *The Region of Wheat and Fruit.*—It must not be inferred from this appellation that these productions of the soil do not thrive in the last mentioned region, but merely that they are much more abundant here, and that the climate is more genial to their growth. This region may be said to extend to Yekaterinoslav, or to the 48th degree of latitude. Several kinds of grain, as buckwheat, millet, &c., are cultivated here with much greater success than in the last described region. The cultivation of tobacco, although it exhausts the soil, is rapidly spreading, and will eventually become a source of great profit. Hemp is also found to thrive better than in more northern situations, but the chief object of the agriculturist is the breeding of cattle. Studs of horses and sheep-farms exist here as separate establishments; but the breeding of horned cattle is generally connected with husbandry, and on a much larger scale than in the northern provinces. Bee-hives are also a source of no small profit, especially to the peasants. The abundance and cheapness of corn encourage distillation. Spirit is thus the principal and almost only article of fabrication. The greater part of this region was colonized later than the preceding, and the stability of its population in the southern part can only be dated from the conquest of New Russia and the Crimea. This country may be called the granary of the empire, for it supplies not only Petersburg and the army, but furnishes the principal part of the raw productions (except flax) for exportation.

In consideration of the vast importance of this region, we must extend our observations to several points connected with its husbandry, namely, the steppes, the population, the variations of the climate, the extent of the villages, and the general method of cultivation. *The steppes* are peculiar to eastern Europe and middle Asia; and are altogether distinct from the American savannahs, which, during the tropical rains, are partially inundated. The natural causes of the destitution of forest on the steppes are, 1st, The hardness and tenacity of the earth, which in many places is of such a nature as to prevent the growth of trees without previous digging and breaking up of the soil. 2d, The black loam of which they consist is not favourable to the growth of forest. 3d, The aridity of the climate and the elevated situation of the steppes, which latter circumstance probably occasions the growth of a number of dwarf fruits, especially apples, which are found on bushes no higher than the grass. 4th, The predominance of salt in many parts is not only unfavourable to the growth of trees and grass, but renders the soil unfit for agricultural purposes. The accidental causes consist in the destruction of the woods, of the former existence of which there have been discovered indubitable traces. Such destruction may be accounted for by the nomadic habits of the former inhabitants; by the burning of the steppes in dry seasons, the destruction of the young trees by the cattle, &c. This is the more probable, as, from a very remote period, this country was the abode of various tribes now extinct, who carried on an unceasing predatory warfare against their more settled agricultural neighbours. Forests once thoroughly destroyed seldom, if ever, flourish again unless cultivated by the hand of man; and the country, thus left bare and exposed to every wind, becomes arid, and the climate greatly deteriorated. The steppes, in general, may be divided into the grassy, the heathy, the saline, the sandy, and the stony, not to notice the low grounds covered with reeds. These steppes have considerable influence on the population and husbandry of this sixth region. If, on the one hand, they are favourable to the breeding of cattle; on the other, their destitution of wood, the unfitness of the soil in many parts for farming purposes, the variable nature of the climate, the difficulty of preserving the corn-fields from the inroads of the cattle, and, above all, the scanty supply of water, all concur to retard the adequate increase of the settled population, and to give rise to a wretched method of culture called the *perelog* plan.* The sterile part of the steppes is scarcely less profitable than that which is cultivated, for on it are found the salt lakes, probably the remains of a sea which at some former period covered the country, or perhaps their saline qualities may arise from strata of rock-salt forming their beds, or the qualities of the soil through which the various rivulets run in their course to the lakes. It is not improbable, that, by means of perseverance in an improved system of cultivation, many saline districts may become fertile in the production of useful plants. Some parts may be laid under water to great advantage, especially if they succeed in constructing conduits of fresh water. But the chief advantage derived from the steppes is the means afforded of rearing large flocks of fine-woolled sheep. Considering the low price of land in Russia, the immense extent of the steppes that furnish good pasturage for sheep, and the cheapness of labour and bread, the period may arrive when Russia will furnish the greater part of Europe with wool, except perhaps the very finest sorts, which it may be more convenient to produce where sheep breeding is connected with agriculture in its highest state of improvement; and even towards this end the Baltic provinces have made considerable progress. The variety of climate in this region is much greater than in the last described. The western governments, as Keiv and Podolia, are favoured with very mild seasons, but towards the east, the ungenial effects of the vicinity of Asia are plainly felt, even without entering Siberia, and the more so as we approach the limits of the next, or seventh region. This variation is distinctly visible in the productions of the earth, it being no longer possible, though on the same degree of latitude, to produce and rear those plants which thrive in the west. Perhaps, in the course of time, when the soil and forests are properly cultivated, a considerable improvement may take place in the climate.

With respect to the population of this region, it may be divided into the old established Russian inhabitants, who have from time immemorial dwelt in the western governments of Kiev, Podolsky, Malo-Rossia, &c., and those that have settled at a later period in Kursk, Saratoff, &c. The original Russian governments are pretty well peopled, according to their extent, and the imperfect system of agriculture which has hitherto prevailed,—a system requiring a far greater extent of arable, meadow, and forest land than would be necessary under an improved system of husbandry; so that, in some parts, a want of land has been felt, especially in Little Russia and the government of Poltava, where the former prosperous condition of the people has been considerably deteriorated by the extraordinary increase in the consumption of ardent spirits.

7. *The Region of Maize and the Vine.*—Although the vine and Indian corn are characteristic productions of this region, it must be remembered that it produces also all those common to the last described. The vine, as is well known, thrives only in certain climates and situations; and Indian corn is not to be considered as an exclusive product, but rather as a distinguishing feature. This region includes Bessarabia, the New Russia, the territory of the Don Cossacks, the government of Astrachan, and the Caucasus. The southern part of Siberia, from the peculiar nature of the climate, can scarcely be said to form any portion of it. The greater part of the above mentioned governments and districts consists of steppes, partially used as pasturage, and in part unproductive. The Crimea (at least the southern part of it,) belongs rather to the next region. The hilly parts of Bessarabia are fruitful and well supplied with wood. The low lands are steppes, which, towards the Danube, are covered with reeds, and the air unwholesome. On the banks of some rivers, and in various other parts, the vine may be cultivated to advantage. The government of Cherson presents a vast plain intersected by deep narrow ravines or dells; the soil is hard, and but little suited to the growth of trees, without the assistance of art, exposed to frequent droughts, and consequently to bad harvests; besides which it is at times (as well as other parts of the seventh region), subject to the ravages of the locust. The government of Yekaterinoslav suffers less than that of Cherson; but eastward towards the Donetzky ridge, near Bakhmut and Slavianoserbsk, droughts are more frequent. The northern part of the government consists of steppes fit for pasturage, and abounding in salt; the southern part enjoys a most genial climate, especially along the shore, where the sea has considerable influence on the atmosphere, but this tract belongs properly to the eighth region. Not only the vine and other delicate fruit-trees grow here in perfection, but also the olive, the caper, &c., which have been planted, thrive, and will doubtless, in the course of time, be cultivated on a large scale. The southern parts of the government of Voronesh are steppes, but capable of cultivation. The territory of the Don Cossacks is also steppe, towards the south-east, but fit for all the purposes of husbandry. Coal is found in the Donetzky ridge, as well as mines of lead and iron. Other parts are more or less suitable for the purposes of agriculture and the growth of the vine. The government of Astracan, has, in many parts, a sandy soil, affording scanty pasturage for the cattle, and the vine is cultivated in the Asiatic manner, by irrigation, which renders its fruit unfit for wine. The northern part of the Caucasus is principally sandy, interspersed with saline tracts and rivulets. Breeding of cattle is carried on to great advantage by the nomadic tribes which inhabit it. The southern parts towards the rivers Terek and Kuban are good for tillage, especially towards the west. In the environs of Kizliar, a kind of wine is made, that is chiefly used in the distilling of brandy, and no doubt there are many other situations where the vine would thrive. The territory belonging to the Cossacks of the Black Sea, consists partly of very low grounds, the rest resembles the western part of the Caucasian government. Population is but thinly scattered in this region, and the attempts at agriculture are all of recent date. A considerable portion of the population is of Asiatic origin, and not a few of the tribes still retain their nomadic habits. The other inhabitants of the country consist of Russians, Moldavians, Bulgarians, Greeks, and German colonists, the latter including the Menonists, celebrated for their superior husbandry. Gardening, as a speculation, is carried on to a considerable extent, but the numerous flocks of Merino sheep form the principal source of

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*This consists in sowing corn on fresh land, until its productive powers are exhausted, and then abandoning it, to seek another spot to cultivate.

wealth, and they may yet be augmented to an almost incalculable extent.

The principal defect of this region is the almost total absence of forests, and the great difficulty of rearing trees. Thus for want of wood the inhabitants are obliged to burn reeds, *buyan*,* straw, and *kizyak* †; but the employment of the two last mentioned articles is contrary to the rules of good husbandry, although it can hardly be said that the time is arrived for the introduction of an improved system into these provinces.

8. *The Region of the Olive Tree, the Silk Worm, and the Sugar-cane.*—This region includes the provinces beyond the Caucasus (Zakaukasky), but the climate, owing to the mountainous nature of the country, is exceedingly various, as may be seen by the diversity in the productions of the soil. The plants peculiar to hot climates grow in the valleys, while the hills are covered with corn and pasturage for cattle. The soil is also of various kinds, and towards the east there are extensive steppes. The local climates of this region may be divided in the following manner; first, The summits of the mountains always covered with snow; then the beginning of vegetation, where nothing but pasturage for cattle is found; then follow the corn-fields; below them the vine flourishes, and we meet with the mulberry and other fruit trees; while still lower, in the vallies, particularly in the Persian provinces, grow cotton, rice, and other southern productions, which require artificial irrigation, an operation familiar to the inhabitants of Asia. The olive thrives chiefly in the western part, and only in those spots peculiarly suitable to its culture. The sugar-cane, that important colonial production, has been planted, and is spreading in some of the low and rich lands about Kura. This succession of climates, according to altitude, presents a curious resemblance to the climates as they follow each other according to latitude. The forest region is the only one that is wanting in the Zakaukazian mountains. The country beyond the Caucasus produces spontaneously several objects of great value, as a peculiar kind of cochineal, assafœtida, &c., which may become the sources of great ultimate advantage. The most important, however, of the productions of this region, is doubtless silk, which may be said to be indigenous to the country.

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SADLER, Michael Thomas, F.R.S. a parliamentary orator, who distinguished himself by his philanthropic exertions in the cause of the poor and the labouring classes, was born at Snelstone, a village in the south of Derbyshire, in January, 1780. He was descended on the father's side from the celebrated Sir Ralph Sadler, one of queen Elizabeth's ministers, and an important instrument in bringing about the reformation. His mother's family were French refugees at the revocation of the edict of Nantes. He was educated principally at home, and exhibited extraordinary powers of mind in very early youth, having mastered the higher branches of mathematics and astronomy by the time he was eleven years of age. His father intended him for one of the learned professions; but, when about eighteen years old, he was induced to join his brother in business at Leeds, where he continued engaged in mercantile pursuits, but not to the exclusion of more congenial literary labours, until he was called into public life by the ministerial proposal of the Catholic relief bill. On a vacancy occurring for the borough of Newark-upon-Trent, in March 1829, a deputation of the electors waited upon Mr Sadler, at Leeds, and invited him to become a candidate. He immediately complied, and triumphantly conducted an arduous contest, though opposed by Mr Serjeant Wilde, one of the most able and energetic members of the bar. Mr Sadler immediately distinguished himself by a very long and eloquent speech against the Roman Catholic claims, delivered in the House of Commons on the 17th of the same month; and during the continuance of the discussion he was a prominent champion of the Protestant cause. At the general election of 1830 he was again chosen for Newark, and in 1831 for Aldborough, in Yorkshire. At the election of 1832, his late borough being disfranchised, he was a candidate for the new borough of Leeds; but, though highly esteemed by a large number of his townsmen, his reputation as an anti-reformer preponderated against his less equivocal merits, and he was unsuccessful. During his parliamentary career, he was chiefly occupied in supporting whatever he thought would advance the happiness of the mass of society; and his political views for ameliorating the condition of the lower orders were indeed most extensive, and the measures which he himself introduced into the legislature for this benevolent object most comprehensive and important. He brought a bill into parliament to provide agricultural parishes with the funds for allotting small portions of ground to their deserving poor, which, although it did not become a legislative enactment, was extensively circulated, and has been acted upon in several parishes with the happiest results; in one large parish not only to the greatly increased comfort of the poor, but to the almost complete extinction of the poor-rates.

For Ireland he always expressed the deepest interest and sympathy, and twice introduced, enforced by the most impassioned and touching eloquence, the important measure of a poor law for that country into parliament; on the last occasion losing his proposition by a nominal majority only. Of this humane measure he was in public and private the powerful and unwearied advocate, and, undismayed by the general opposition it provoked, brought the cause of those who had "none to plead for them" again and again before the British public. During the last session he sat in parliament, Mr Sadler was almost wholly occupied in prosecuting a bill he had brought before the legislature for the protection of children employed in manufactories—the ten-hour bill, as it is familiarly called. This measure was referred to a select committee, of which Mr Sadler was chosen chairman, and the toil and responsibility thus imposed upon him of collecting the vast mass of evidence contained in their report, probably laid the foundation of his long and fatal illness. Neither did he, after all, succeed in passing this measure of mercy, although the voice of public opinion compelled his reluctant opponents, in a subsequent session, to bring one forward professedly similar.

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* The high grass of the steppes.

† Dried cow-dung.

Mr Sadler was the author of several highly esteemed works, the most important of which are, "Ireland, its Evils and their Remedies,"—and an elaborate essay on "The Law of Population," in two vols. 8vo., written principally with a view to controvert the opinions of Malthus. A third volume, completing this scientific and admirable work, was unfortunately never finished. His death took place, at New Lodge, near Belfast, on the 29th of July, 1835. At the time of his death, he was leading partner of the firm of Sadler, Fenton, and Co. of Belfast. In private life he was affectionate, generous, affable, and accessible to all. His appearance was remarkably that of a man of genius; and there was an enthusiasm and energy in his manner strikingly characteristic of an elevated and powerful mind. His social qualities were of the highest order, and his conversation was eminently brilliant and instructive. It was said by lord Bacon, at the close of life, "the poor have been ever precious in mine eyes;" and no man could more fully adopt this Christian sentiment than Mr Sadler. As a statesman, his parliamentary career was invariably characterised by integrity, honour, benevolence, sound judgment, and genuine independence of mind. In depth of reasoning, in perspicuity of argument, in extensive information, in aptitude of reply, in commanding eloquence, he had scarcely a competitor in the British House of Commons.

SAGO, (*a.*) The sago of commerce is the product of a species of palm which grows naturally in various parts of India and Africa. It is one of the most common, and at the same time one of the most useful of the vegetable productions of the countries in which it is found. The central vein or rib of its ample leaves is used by the natives of Africa for various useful purposes; they form it into weapons of offence, and they employ it for the purpose of capturing fish: for this purpose a species of fish-hook, resembling the barb of a harpoon, is fixed to one end, to the other a line is fastened, which is afterwards passed round the body of the sportsman. Thus armed, he wanders along the sea-shore, and on the banks of the river, and whenever he perceives a fish, throws his dart, and generally with success. His prey is allowed to remain for some time, without an attempt on his part to draw it out of the water, until it is sufficiently exhausted by its efforts and by loss of blood.

Of the perfect leaves the Indians form fences to their fields, coverings to their houses, and when properly fastened together by means of branches of trees, the dwellings themselves; these habitations are much more durable than could be expected, on account of the great strength and thickness of these bundles of leaves.

The natives of Africa obtain a liquor from this tree, which much resembles palm wine, but is stronger and of a deeper colour. They have two methods of extracting this liquor; the first consists in collecting the sap in calabashes, from incisions made in the fleshy substance of the summit of the tree from which the new leaves proceed. The second plan is to collect a quantity of the fruit, to strip it of its rind, and steeping the kernels in the sap already noticed, diluted with water, to allow the whole to ferment. This second kind of wine is still higher coloured, and more intoxicating; it sparkles like champagne, and can be kept a considerable time.

The production for which this tree is best known in Europe is sago, although other trees of the palm tribe also yield it in greater or lesser quantities. The sago is principally extracted from the pith which fills the trunk of the palm, and is of a more delicate colour and nature in the young than in the old trees.

The trunk of the tree being split in the direction of its length, the operator removes the pith which he breaks in pieces, and throws into a vessel made from the bark of a tree, and placed over a horse-hair sieve; he then pours water over the mass and the finer parts of the pith pass through the sieve, and are received in pots which are provided for the purpose; the fibrous portions of the pith are retained by the sieve.

The liquid thus obtained is, in the first instance, turbid, from the quantity of matter it holds in solution; this, by degrees, settles to the bottom of the vessel, and the clear liquor is drawn off. The mass that remains is then passed repeatedly through shallow dishes of metal perforated with numerous small holes; this is continued until it is sufficiently dry to prevent the grains into which it is formed by the process, from again becoming united. The reddish tinge which is observed in the sago of commerce, arises from the effect of the heat to which it is submitted to render it perfectly dry.

In the Moluccas and the Philippine islands, the soft paste of the sago, before it is dried, is formed into cakes about six inches square and of the thickness of the finger. These are strung together in bunches of ten and twenty and exposed for sale; it is also employed in the making of puddings, gruel, and for the same culinary purposes to which wheaten flour is applied in this country.

The sago palm is a tree of moderate height, seldom attaining to twenty feet. The fruit, which is a dry oval cone covered with small scales, grows in clusters, forming a large oval tuft or bunch.

There is a palm-tree closely allied to the sago palm, which grows in great abundance in South America, in the neighbourhood of the Oronoko; to this tree a native tribe, the Guarinis, are indebted for nearly the whole of their subsistence; and thus, says Humboldt, "we find in the lowest stage of human civilization, the existence of a people depending entirely on a single species of tree, in the same manner as some insects are confined to certain parts of a flower." The Guarinis also form their habitations, if they deserve that name, from the leaves of this tree, they make mats from the fibres of its leaves, and during the rainy season, when their country is under water, they live on the summit of the trees. The mats they form are suspended from tree to tree, and covered on the upper side with clay. On these moist couches the women light the fires necessary for their cookery, and the traveller, who during the night is floating down the stream of the river, sees lights, as it were, suspended in the air at a considerable elevation.

In addition to the nourishment derived from the pith of this tree, a wholesome repast is furnished by the kernels of the fruit when ripe.

SANDFORD, Sir Daniel Keyt, K.B.,D.C.L., professor of Greek in the university of Glasgow, was the second son of the Right Reverend Daniel Sandford, bishop of the diocese of Edinburgh, and was born in that city on the 3d of February, 1798. He received the rudiments of his education under the superintendence of his excellent and accomplished father, (who died in Jan. 1830); and both at the high school and university of Edinburgh, he was the best Grecian of his time. In 1813, he was placed under the care and tuition of his godfather, Mr Keyt, at Runcorn, in Cheshire, and remained there two or three years, pursuing his classical studies with enthusiastic ardour. In 1817, he entered Christ Church, Oxford, and soon attained the first rank among the students in that celebrated seat of learning. Of the university debating club, in which questions not only on literature, philosophy, and history, but even on general politics, were discussed with freedom, Sir Daniel became an early and active member, and there first learned the art, as well as tasted the delight, of stirring the hearts and exalting the minds of a large concourse of men. In 1820 he took his degree with first class honours, and gained the university prize in 1821. The subject was the "Study of Modern History," which he discussed with great acuteness and eloquence. The Greek chair in the university of Glasgow having become vacant by the death of professor Young, Sir Daniel, although an Episcopalian, was, on the recommendation of men of all parties, elected his successor in September, 1821, at the early age of twenty-three. He entered with enthusiasm on the duties of the professorship in the beginning of the session of that year, and not only sustained but increased the celebrity of the Greek chair. He introduced many improvements into the system of instruction that had been pursued by professor Young; and by his unrivalled skill as a teacher, and the enthusiasm of his classic genius, awakened a new interest in the study of Greek literature, not only in the university of Glasgow, but throughout all Scotland.[*] Among the scholars of Great Britain, he held the very first rank, and, perhaps, since the time of Porson, it has been justly observed, there has been no one equally distinguished for profound and elegant scholarship, and an exquisite and happy mastery over the subtle niceties of the Greek tongue.

Ambitious of political distinction, Sir Daniel took an active part in the numerous meetings for parliamentary reform which were held in 1831 and 1832, and by his extraordinary abilities as a public speaker, rapidly attained great popularity. On the first election of members for Glasgow, under the reform bill, he was one of six candidates who contested for the representation of that city, and on that occasion he stood third on the poll. In 1834, he was elected member for Paisley, and the faculty of the college left it optional for him to return among them at the end of a year, should his success in his parliamentary career not equal his most sanguine expectations. He sat one session in parliament, but as his health during that period was much affected, he deemed it prudent to resign his seat. In the beginning of the following winter he resumed his academic labours, and his return to the peaceful and Attic retreats of Glasgow college was hailed with delight by his colleagues, by the students, and the friends of education in general. From this time till his death, he lived during the session in college, and in the summer in the vicinity of Rothesay, in the island of Bute. He died of typhus fever, at Glasgow, on the 4th of Feb. 1838, in the fortieth year of his age, and, in conformity with his own wish, was buried in the high church-yard burying ground, Rothesay. His remains were followed in mournful procession, to the place of embarkation, at the Broomielaw, by the professors and students, magistrates and clergymen, of the city, besides a large number of the most respectable inhabitants, while all the vessels in the harbour had their colours hoisted half-mast high.

Sir Daniel was married to Miss Charnock in 1824, and left a young and numerous family. The honour of knighthood was conferred on him at St James's palace, by William IV., in 1830; and during his residence in London, in 1834, he took the degree of doctor of civil law. His personal appearance was prepossessing. In stature he was about the middle size, and of graceful figure. His countenance was pale, his features sharp, and his forehead high and expanding. His eyes, though apparently weak, and in general heavy, assumed great brilliancy when he became animated in speaking or reading. His manners were affable and courteous in the highest degree. His private tastes, and the bias of his mind, were decidedly classical, which tended to imbue his habits and capacities, as a teacher of Greek, with a generous warmth and enthusiasm, that contributed largely to his success in this department of elegant learning. As a public speaker, few equalled him in the grace and variety of his oral addresses, or exhibited equal mastery over the feelings of an audience. He possessed great tact in the management of his subject —was rich and ready in his illustrations—and keen and sarcastic in his irony. Sir Daniel published several elementary works for the use of his class, such as a translation from the German of Thiersch's Greek Grammar, Greek Extracts, Introduction to the writing of Greek, Exercises in Homeric and Attic Greek, &c. He also contributed a variety of valuable articles to the Edinburgh Review and Blackwood's Magazine. In the latter periodical, his poetical translation of the Plutus and Nubes of Aristophanes, and several papers entitled Alcibiades the Boy and Alcibiades the Man, were highly esteemed. But his most finished production was the Essay on the Rise and Progress of Literature, which he wrote for this Encyclopedia, and which has been pronounced by professor Wilson of Edinburgh, and other competent critics, to be alike admirable for the learning, judgment, and eloquence which it displays, and, as a summary of the subject, to be unsurpassed by any thing of the kind in the English language.

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[*] The general character of the classical students of the university of Glasgow may be gathered from a simple fact brought forward by Sir D. K. Sandford in 1828. "At that date, the Glasgow exhibitioners had formed, for fourteen years, about *one-twentieth* of the resident under-graduates of Balliol, Oxford, and yet had obtained *one-third* of the university honours which had fallen to the share of that college; that is, the proportion of academic distinctions was nearly *as seven to one* in favour of the Glasgow exhibitioners, over the students coming from all other institutions and all other parts of the kingdom. The proportion has not been diminished since the time when this calculation was made."—See *Observations by the Principal and Professors of Glasgow college, on Schemes of Reform proposed for the university of Glasgow. Glasgow*, 1837.

SANDHURST, a parish in Berkshire, England, in which is situated the royal military college, for the instruction of cadets intended for the army, and officers possessing military commissions. The two branches of this institution were first placed at High Wycombe in 1799, and removed to Great Marlow in 1802, by their founder the late duke of York. The establishment was removed hither in 1812, and since 1820 both branches have been united. The senior department is a school for the staff, where officers are admitted to study; and the junior department, for the professional education of young gentlemen intended for the army. Since its foundation more than 3500 individuals have been rendered competent to serve in the army. The institution is governed by a general and a colonel as lieutenant-governor, with other officers acting under the board of commissioners. The building, which is a plain neat edifice, with a doric portico of eight columns, is calculated to receive 400 cadets and thirty students of the senior department. The houses of the governors and officers form a square at the rear of the college. There are also an observatory, a room for examinations, a chapel, and a spacious riding-house. The whole stand in the midst of finely laid out grounds and plantations; and in the front of which is a spacious sheet of water. Population of parish in 1841, 563.

SAXONY, (*a.*) *Statistics.*—The total population of Saxony—

In 1832	was	1,558,153
1834	—	1,595,668
1837	—	1,652,114

Number of each Religious Denomination.

Christians.—	Evangelical Lutherans	1,620,393
—	Calvinistic Reformists	1,803
—	Catholics	28,998
—	Greek Church	72
Jews		848

From a comparison of the amount of the population, as found by the census of December 1837, with that of the preceding census of December 1834, it appears that, in the intermediate period of three years, an increase arose of 56,446 individuals, or 3·537 per cent.—3·709 per cent. of males, and 3·375 per cent of females; which is for each year an increase of 18,815: that is 1·114 per cent. by additional births, and 0·065 by assumed immigration. This is the average rate of the "movement" of populations in central Europe. A recent statistical work, in two vols. 4to., on the Prussian district of Dusseldorf, shows that population, which in 1816 was 577,000, and in 1835, 720,760, to have steadily increased somewhat above 1 per cent. per annum by the excess of births over the deaths, throughout the intermediate period of twenty years. However, the disturbing effect of contingent circumstances causes the excess of births to range generally between ½ and 3 per cent. By an excess of ½ per cent. per annum, a population is doubled in 139 years; by 1 per cent. in 70 years; by 1½ per cent. in 46½ years; by 2 per cent. in 35 years; by 2½ per cent. in 28 years; and by 3 per cent. in 23½ years.

The whole area of the kingdom of Saxony contains 271·676 geographical square miles, and the total number of the population in 1837 was 1,652,114. There is therefore, on average, 6,081 persons to each geographical square mile, for 1837; and for 1834, 5,873. Excluding the military, it is for 1837, only 6,023; and for 1834, 5,817. In three years there appears then to have been an increase of 208 to the square mile; and, excluding the military, an increase of 206[*]. The relative amount of the town and country inhabitants was, in 1837, as 1,000 of the former to 2,068 of the latter; and in 1834, as 1,000 to 2,108.

The proportion of males to females, in the whole population of 1837, including the military, was as 1,000 to 1,055; and, excluding the military, as 1,000 to 1,070. The proportion of males capable of bearing arms constitutes generally one-fifth part of the population.

With regard to the relative numbers of the different religious denominations, it appears that, on an average of the whole population, there are in 100,000 inhabitants—

Lutherans	98,081
Calvinistic Reformists	109
Catholics	1,755
Greek Church	4
Jews	51

Which compared with the numbers in 1834, shows the increase of—

Lutherans	to be	35	in 1,000
Reformists	—	113	—
Catholics	—	28	—
Greek Church	—	200	—
Jews	—	2	—

Including the number of married persons living separate, and the military, there is something more than $\frac{7}{20}$ of the whole population married, or 342,565 in a million; that is, one marriage to 5·67 inhabitants.[†]

The number of children under the age of fourteen years, in 1837, amounts to somewhat more than ½ (in 1834 almost exactly ½) of the whole population. So that, excluding the military, and the married persons living apart, there are, on an average, very nearly two children under fourteen to each married couple; or to every 100 couples, 187 children under the age of fourteen.

With respect to the proportion of each sex among widowed persons living, it appears that, on an average in 100 of this class, there were, in 1837, thirty widowers, and seventy widows; and in 1834, twenty-nine widowers, and seventy-one widows.

The number of persons deaf and dumb is to the whole population as 1 to 1,401. (For 1834 as 1 to 1,579, and for 1832 as 1 to 1,334.) And the number born blind is as 1 to 3,878. For 1834 as 1 to 4,924, and for 1832 as 1 to 3,675).

The Saxon statistical society publishes annually a very elaborate tabulated abstract of the local registries of births, deaths, marriages, and number of religious communicants, throughout the kingdom.

The following is the annual average number of births during the six years from 1832 to 1837:—

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[*] For the sake of comparison, it may here be stated that the whole area of the kingdom of Prussia contains 5,077·41 geographical square miles, and in 1837 the total population was 14,098,125; which is, on an average, 2,776 persons to each geographical square mile. In France, according to the last census of 1836, the number to each square mile (English) was, with the exclusion of Corsica, 166. In England, by the last census of 1831, there were 259 persons to the square mile; in Wales 108; in Ireland 243; and in Scotland 84.

[†] In Prussia the proportion of the number married, in 1837, was something more than one third of the whole population, or 335,144 in a million.

	Males.	Females.
Legitimate	28 472	26,625
Illegitimate	4,453	4,246

Twin births, pairs of males 293, of females 259; one of each sex 255.

Births of three at once 7; born dead, males 1,716, of females 1,248.

Total of births, males 32,925, of females 30,871; of males and females 63,796.

A comparison of the number of children born in 1837, namely, 64,593, with the total number of inhabitants at the same time, namely, 1,652,114, shows the fact of the birth of one child to 25·57 inhabitants.

In 1837 the number born was greater by 13,529 than the number of those who died. In 1836 it was greater by 18,532.

The excess of males over females born was, in 1837, 5·27 per cent.; and, on an average of the six years, 1831–37, it was 6·24 per cent.; that is, there were born to 100 males 94·76 females, or to 100 females 105·56 males. Generally the annual proportion of births of males to females is as twenty-one to twenty; and the proportion of deaths of male to female children as twenty-seven to twenty-five, so that in the period of maturity the sexes are nearly equal in number.

Of the whole number born in 1837 the proportion born dead was 4·61 per cent.; in 1836, 4·76 per cent.; and the average of the six years, 1832-37, was 4·64 per cent.

The number of twin births, in the same sexennial period, was 4,835; the number of births of three at once, forty-four; in the year 1833 there were fifteen. The proportion of male to female children is, in the twin births, as 100 to 91·86.

In 1837 the illegitimate children born were to the legitimate as 1 to 6·2; in 1836 as 1 to 6·15; and to the total number born as 1 to 7·2. On an average of the six years the proportion of illegitimate to the legitimate is as 1 to 6·33, and is 2-15ths of the whole number born. In the sexennial period, 1836-37, there were, on an average, 5·5 illegitimate children to 1,000 inhabitants.* The number of illegitimate births is found to be greatly augmented by the existence of well-supported institutions for foundlings; and a remarkable confirmation of this assertion is furnished in the city of Mayence, where the abolition of the foundling hospital has been directly followed by an important decrease of illegitimate births.

Considering the number of births, with regard to different months, it appears that the greatest number, 6,002, occurred in January; and the least, 4,470, in November; and this remark is equally applicable to the average of the six years. Indeed, it is a fact confirmed by all carefully kept registers, that the greatest numbers of births are found in the first months of the year.†

Of the 64,595 born in 1837, there were,—

	Males	Females.	Total.
Legitimate	28,569	27,059	55,628
Illegitimate	4,602	4,365	8,967

In the same year there died—

	Males.		Females.		Total.
	Legitimate.	Illegitimate.	Legitimate.	Illegitimate.	
At Birth	1,425	295	1,035	225	2.980
In the 1st year	7,812	1,547	6,389	1,246	16,994
Between the 1st & 6th years	2,895	289	2,719	329	6,232

The proportion of the numbers born dead to the whole amount of deaths is as follows:—

	per cent.		per cent.		per cent.
1832	5·9	1834	5·96	1836	6·63
1833	5·5	1835	7·	1837	5·83

Annual average of the six years . 6·12 per cent.

In the whole number born dead, the proportion of males to females is as 100 to 72·73. The proportion of the number of illegitimate to legitimate children born has been shown to have been as 1 to 6·2, or 16·13 per cent.; and with regard to the number of each class born dead, that of the illegitimate is to the legitimate as 1 to 4·73, that is, 21 per cent.; showing a rate of mortality greater by 5 per cent. among the illegitimate. The deaths before the completion of the first year show 1 of an illegitimate child to 5·08 legitimate; and from the first to the sixth year (commonly the first of school-going) 1 to 9·08. Of legitimate children the proportion born dead is 4·42 per cent., and of illegitimate 5·8 per cent.

The greatest proportion of deaths, in places having above 1,000 inhabitants, has been 1 to 18·5 persons. And here it may be remarked, that the statements exhibited in the works of some eminent writers that the ratio of mortality is always greater in the town than in the country population, is controverted by the honourable director of the Saxon society, who says that, many of his own observations serve to prove the reverse. That the great advantages of pure air, athletic exercise, simple food, and exemption from habits of luxury, are often partially, if not wholly counteracted by the inferiority or deficiency of medical attendance in sickness, disregard of cleanliness, bad food, spirituous drinks, and excessive labour. That only in very large and densely populous cities the mortality exceeds the medium ratio; and that only in wealthy villages it falls below the medium: while throughout whole rural districts, where poverty and destitution prevail, the rate of mortality, instead of the general average of 1 in 34, is as high as 1 in 12. However, the present returns for Saxony exhibit results at variance with this assertion, for of the total number of deaths in 1837,—namely, 51,064,—18,070 occurred among the inhabitants of towns, comprising a population of 533,303; and 32,994 among inhabitants of villages and rural districts, comprehending a population of 1,102,887; showing that the average ratio of town mortality was 3½ per cent., and that of the country scarcely 3 per cent. In England the town and country populations are not separately registered. The returns of the last census in 1831, confuse the numbers of inhabitants of towns with those of the parishes of which they constitute a part, so as to prevent the possibility of discrimination; for, in many instances, the parishes are of great extent.

In general the proportion born dead is considerably less in the country than in towns, especially in large and densely populous capitals.

In 1837, the proportion of marriages (13,546) to the whole population (165,214) was 1·64 per cent.; in 1836 it was 1·63 per cent.

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* In Prussia, in 1837, there were born 518,392 legitimate children, and 39,501 illegitimate; the latter being to the former as 1 to 13. In France, according to the last census, the proportion of illegitimate in the whole numbers of births was, in the department of the Seine, 31·3 per cent., that is, nearly one-third.

† Dr Guiette, of Brussels, having made some curious investigations respecting the influence of day and night on human births, has found that in nineteen years, out of 5,448 births, 2,949 occurred in the night, and 2,499 in the day. That the greatest numbers were at 11 in the night (358); and at 2 in the night (304); while the least numbers were at 7 in the morning, and 3 in the afternoon.

The greatest proportion (1 to 116 inhabitants) was in the district of Bautzen, and the least (1 to 124) in the district of Dresden.

Of the 162 marriages of parties differing in religious profession, in 1837, sixty-nine were marriages of protestants with catholics. In 1836, by the death of married persons the number of marriages dissolved was 10,273; in 1837, 11,856; still the number of married couples exhibited an increase amounting to 3,273.

A general comparison of the registrations relating to central Europe gives the following average results:—

	Births.	Deaths.	Marriages.
In villages .	1 to 23	1 to 40	1 to 115
Towns . . .	1 — 27	1 — 30	1 — 105
Large capitals . .	1 — 31	1 — 25	1 — 113

SCILLY ISLANDS, (*a.*) The Scilly islands lie about nine leagues west by south from the Land's End, Cornwall, from which they are clearly visible. This wild and romantic cluster of rocks, many of which, on a distant view, appear like old castles and churches rising out of the sea,—although scarcely known, except perhaps, by name, to most persons in this country, possesses very considerable claims on our attention. These islands were known to the ancients. By the Greeks they were called *Hesperides* and *Cassiterides*, or the *Tin* islands, probably from their contiguity to Cornwall (where the Phœnicians traded), for not a vestige of any ancient mine can now be discovered upon them.

It is evident, however, that they have undergone great changes since the period referred to, as Strabo speaks of the islands as not exceeding ten in number, whilst now there are upwards of one hundred and forty, only six of which, however, (for the greater portion are mere rocks,) are inhabited. These are,—*St Mary's*, which contains twelve hundred inhabitants; *St Agnes*, three hundred; *St Martin's*, six hundred; *Trescow*, three hundred and fifty; *Bryer*[*], two hundred; and *Sampson*, one hundred and fifty[†]; making an aggregate of about two thousand eight hundred inhabitants, which are rapidly increasing, the births greatly exceeding the burials; indeed, so healthy is the climate, and so robust are the people, that it is a common saying amongst the Scillonians, "that for one man who dies a natural death, nine are drowned." Cases of deformity are unknown.

St Mary's is the largest of the Scilly islands, being about nine miles and a half in circumference, and containing, as we have seen, nearly as large a population as the rest of the group. It possesses an excellent harbour and pier; and carries on some trade, vessels to the value of £20,000 belonging to it; indeed, twelve fine schooners were at one period launched in the space of six months. The hills are rocky, rising in some places to a great height, and are enriched with mineral ores. The valleys are generally fertile; although there is some marshy ground: the island contains three towns, has a custom-house, a garrison, and druidical remains abound in several places. It seems not improbable, that St Mary's will at no great distance of time, be divided by the sea.

St Agnes, being the most elevated of the islands, and lying directly exposed to the Atlantic ocean, has been chosen for the erection of a very high and strong granite light-house, which stands nearly in the centre, in the latitude forty degrees, fifty-three minutes, thirty seconds, north. This structure, which was built in 1680, has been rendered admirably adapted for the purpose for which it is designed. The machinery is now so contrived, that its light progressively sweeps the whole horizon at intervals of three minutes; and by its regular intermission and increase, is readily distinguished from every other on the western coast. There is also an obelisk on the island of Trescow, which is almost as valuable a sea-mark in the day-time, as the light-house is at night.

The inhabitants of St Agnes, and the most western of the islands, derive their chief source of support in winter from piloting ships; whilst in summer they cruise about the channel for the purpose of disposing of fish, eggs, vegetables, &c., to homeward-bound vessels. There are five boats at St Agnes, employed in this way, each sloop-rigged, of a burden of twenty-two tons, and navigated by seven or eight men, who are joint proprietors in the venture, and respectively share the produce of their industry on shore. They sometimes run on these excursions thirty leagues to the westward, and in case of the homeward-bound being detained by contrary winds, make their terms accordingly—the market being here regulated by *the winds* alone.

One important good, however, results from the summer cruises of the Scillonians, for they are thus enabled to give information of their situation to those vessels which have been driven out of their reckoning from stress of weather and other causes; this information, we are told, has saved many hundred ships, and almost numberless lives, which would otherwise have been lost on the rocks of Scilly. On this ground alone, the Scillonians have a strong claim on the generosity, not only of the British merchant and ship owner, but on the government itself.

SCOT, David, M.D. professor of oriental languages in St Andrew's, was a native of the parish of Pennicuick, where his father was a small farmer. He was educated at the university of Edinburgh for the ministry, and licensed as a preacher. Seeing, however, no immediate chance of promotion in the profession for which he had qualified himself, he became a student of medicine, and obtained the degree of M.D. But as languages were his favourite study, he applied himself to the cultivation of oriental literature, for which he was already prepared by his intimate knowledge of the Hebrew. Having made himself master of most of the eastern languages, both ancient and modern, including Syriac, Ethiopic, Arabic, and some knowledge of the Sanscrit, Dr Scot directed himself to the important business of teaching and preparing young men intending to go out to India. In this department he was eminently successful, and many of his pupils made a distinguished figure not only at the company's colleges in England, but in our civil and military services in Hindostan.

In 1814 the church of Corstorphine, in the neighbourhood of Edinburgh, became vacant, and Dr Scot was presented to that parish, after he had remained for more than eighteen years an unpatronised and unprovided preacher. In this charge he continued to labour for nineteen years, gaining the esteem of his people not more by his simple, unaffected style of preaching, than by his modest, unassuming manners. About 1832 an opportunity offered for resuming those literary pursuits connected with oriental languages, to which he was ardently addicted, in the vacancy that had then taken place in the Hebrew chair of St Mary's college, at St Andrew's. Of the various candidates for the situation, Dr Scot was selected, as possessing the highest and most undisputed qualifications. His appointment infused a considerable degree of enthusiasm among the young men of that university for the study of oriental literature; but unfortunately his career was short, as he was spared to discharge the duties of his office only for two sessions. Ever fond of learning in all its branches, he visited Edinburgh to be present at the meeting of the British association; but was immediately seized with a dropsical complaint, and, after two or three days' illness, died September 18th, 1834. Dr Scot was well known to the literary world by his various publications. Among others he edited Dr Murray's History of the European Languages; and published Essays on Belles Lettres, Lives of some of the Scottish Poets; a Key to the Hebrew Pentateuch; another to the Psalms, Proverbs, Ecclesiastes, and Song of Solomon. He also published a Hebrew Grammar for the use of his own class, and a volume of sermons, "Discourses on some important Subjects of Natural and Revealed Religion, introduced by a short view of the best Specimens of Pulpit Eloquence given to the World in Ancient and Modern Times."

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[*] Between *Trescow* and *Bryer*, there is a very commodious and safe harbour, called *New Grimbsy*, much frequented by coasting vessels in the winter.

[†] *Scilly*, which gives its name to the group, is, singularly enough, one of the smallest, not exceeding an acre in extent.

SCOTT'S MONUMENT. The first monument erected to the memory of Sir Walter Scott was in George Square, Glasgow. It consists of an elegant stone pillar 80 feet in height, surmounted, by a statue, the latter from the chisel of Mr Ritchie of Musselburgh, and admitted on all hands to convey an excellent likeness of the great novelist. In Edinburgh, the native city of Sir Walter, it has been resolved to erect a monument to his memory on a very magnificent scale, from a design by Mr George Kemp,* a self-taught artist. As this monument may be truly considered a national one, collections for it having been made in all quarters of the country, and as some time may elapse before its erection is completed, we make no apology for presenting the reader with the annexed cut of its geometrical elevation.

It may be remarked, that the design which has been adopted, was submitted in public competition with the most distinguished architects of the country, all of whom, it may be supposed, were emulous of the honour of being employed in the erection of what may be called a national undertaking. And the patient investigation as well as the judgment and fine taste displayed by the gentlemen of the committee in making the selection, afford an example well worthy of being imitated. To use the words of the sub-committee, "The monument of Sir Walter Scott will be dear to his countrymen without the adventitious aid which is derived from the mere celebrity of the sculptor, or of the architect by whom it is executed; and it is a gratifying reflection, that the designs now proposed (for the statue and the monument), while they are characterised by great excellence in their respective styles, are the production of native artists, who owe their present success solely to their own genius and personal merits."

The architectural department of the monument is in the form of a gothic cross, the square of the basement of which is fifty-five feet, and the entire height is 180 feet. The groined arch of the basement for the reception of the statue, is 40 feet high from the platform of pedestal to the crown of arch. There is an octagonal room over the groined arch, 15 feet diameter, which it is proposed to fit up as a library to contain the works of Scott. The abutment towers at the angles of the cross are each 91 feet high, in one of which is placed the stair to the first gallery. There are four galleries at different stages, with small winding stairs to each; the highest is 168 feet above the level of the ground.

In any architectural composition, the first requisite is *expression*, and an erection in honour of departed genius should be of such a character as to point out at once to what department of architecture it belongs. The architect, Mr Kemp, has in this respect been singularly felicitous in selecting the form of the gothic cross for his composition. All are acquainted with the fine specimens of gothic crosses, erected by Henry of England, in memory of his beloved Eleanor, and the form has been sanctioned for such uses by the custom of ages. In addition to this, such a form affords an admirable arrangement for the disposition of the statue of the immortal bard. Placed under the great arch of the basement, on a slightly elevated platform, surrounded by a broad flight of steps, it is at such a height from the eye of the spectator, that its excellence as a work of art, and its resemblance to the original may be fully appreciated.

What adds to the interest of the design is its being a composition from Melrose abbey, the finest gothic structure in Scotland, and which is, besides, peculiarly appropriate in this instance, being the favourite haunt of the bard himself, who has identified it with his own immortal verse. The groining of the great arch over the statue is the same as one of the compartments of the choir which is still entire. Many of the turrets, capitals, flowered enrichments, and pinnacles, are composed entirely from this finest specimen of the gothic.

Nothing can be more beautiful than such a plan —the sitting statue reposing under the lofty vault open on every side, will unite admirably with the architecture. In bright and sunny weather, some portion of the figure will always be in strong illumination, beautifully relieved by the dark masses of shadow behind; and a thousand reflected lights from the roof, the buttresses, the pedestal, and the floor, will play around the head and general figure.

After a great deal of discussion, it was at length resolved to place the monument in the eastern division of Prince street. It will thus be seen along the whole extent of that magnificent terrace, and will compose well with the picturesque but subdued masses of the old town in the distance, which will form the back ground. Being placed in the finest part of the city, the stranger from distant lands will not require to ask where is Scott's monument; it will form a conspicuous and beloved feature in "mine own romantic town," from the

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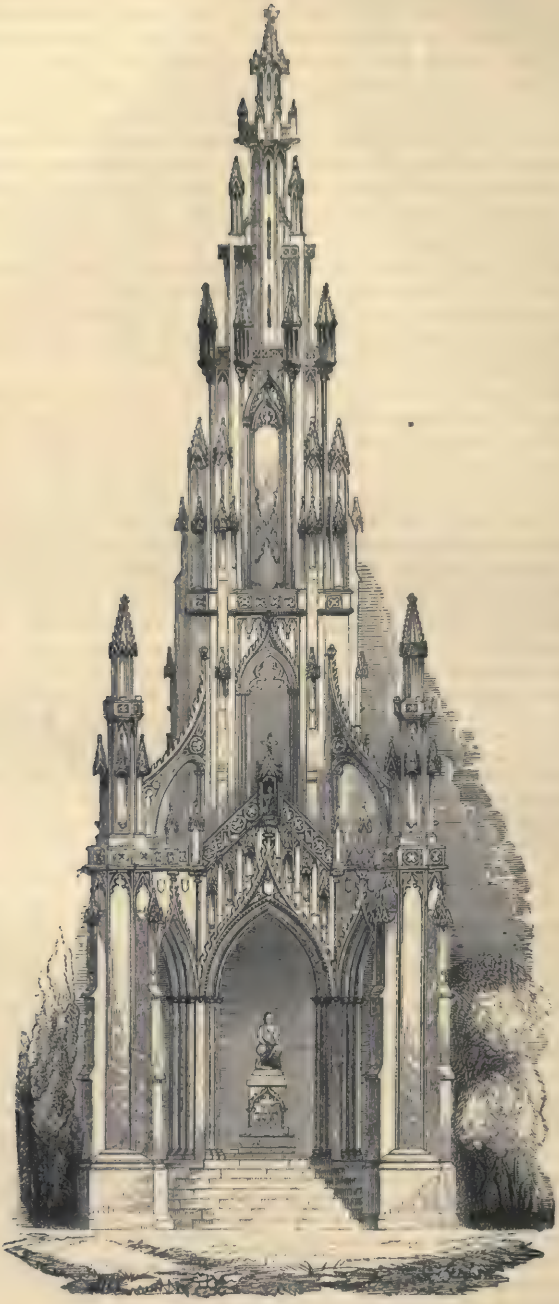
* We understand, that Mr Kemp, animated by a fine enthusiasm for his art, has, at great personal sacrifice, prepared a model of his design for the restoration of our Glasgow Cathedral; and were the same disinterested zeal displayed in this case as in that of Scott's monument, we might hope to see the metropolis of the west ornamented by one of his productions unrivalled for beauty, combining all the elegance of the Scott monument, with all the grandeur of the most magnificent cathedral.



The Scott Monument, Edinburgh.

different galleries of which he may command a panoramic view of the matchless landscape combinations of the Scottish metropolis.

SELBY; a town in the West Riding of Yorkshire, 178 miles from London. It is situated on the banks of the river Ouse, over which is here a bridge, so constructed as to open and shut for the admission of vessels. Steam packets ply regularly from Selby to Hull. Flax spinning used to be carried on here to some extent, but the trade has declined. There is some business done in shipbuilding. In the year 1069, William the Conqueror founded an abbey at Selby for Benedictine friars, which he visited in the following year for the purposes of endowment, and being accompanied by his queen Matilda, she was here delivered of a son, who ascended the throne under the title of Henry I.; the remains of the abbey church show it to have been a noble structure, erected at various periods and in different styles of architecture. Here are places of public worship for the Society of Friends, Independents, Calvinistic and Wesleyan Methodists, Unitarians, and Roman Catholics; and a grammar-school, founded by Edward VI., which has received several endowments at different periods. Population in 1841, 5376.

SHERBORNE; a town in Dorsetshire, 117 miles W.S.W. from London. It is divided by the river Ivel into two parts, called Sherborne and Castleton. The town was anciently a bishopric, but in the year 1075, the see being removed to Salisbury, the cathedral was converted into an abbey; it was originally a noble structure, but great part of it was burnt in the reign of Henry VI.; at the dissolution of monasteries it was made parochial, and is now one of the finest churches in the west of England. The inhabitants are chiefly employed in the silk and linen, haberdashery, and button manufactures; the woollen trade, which formerly flourished here, has fallen to decay. The old castle of Sherborne was first erected in Saxon times; but soon after the conquest it was annexed to the bishopric of Salisbury. We hear nothing further of it until the times of the civil wars in King Charles's reign, when, after having stood out for a long time in favour of the royalists, it was at length taken, after a siege of sixteen days, by Cromwell and Fairfax. A great quantity of ammunition, provisions, plate, &c., was found here, and many distinguished prisoners were taken. The parliament soon after ordered the castle to be demolished, which was immediately done, and but few vestiges of it now exist. With a portion of the materials, the mansion now called Sherborne Castle, or Lodge, the seat of the earl of Digby, was erected. It is a singular edifice, built in the form of the letter H, and it stands in a beautiful and extensive park. Population in 1841, 3768.

SHERBURN; a town in the West Riding of the county of York, situated on the great road from Doncaster to York, 185 miles from London. It is a place of great antiquity, and is celebrated for its cherry orchards, and for a peculiar kind of plum. The church is an ancient Saxon structure, built in a style equally rare and magnificent. Population of town in 1841, 1328; of parish, 3757.

SILURIAN SYSTEM. Those geological strata which have long gone under the general, though somewhat vague, term, transition series, have been lately minutely explained in the Welsh and English districts, by Mr Murchusin; and he has imposed on them the name of *Silurian System* from the ancient title Silures, given to the people inhabiting the district, by the Romans. The Silurian strata are found rising from below the old red sandstone in Herefordshire, Shropshire, Radnorshire, Brecknockshire, Monmouthshire, and Caermarthanshire, and they rest on the older slates, some of which are of the true gray-wack character, comprising the upper part of a series termed the Cambrian system. The silurian system is divided into upper and lower, thus:

Upper Silurian.	1. Ludlow strata, upper and lower, with a central gem of limestone. 2. Winlock (Dudley) limestone and shale.
Lower Silurian.	3. Caradock sandstone. 4. Llancilo flags.

About 350 fossil remains have been discovered in these strata of different character from those found in the superincumbent old red sandstone; the depth of strata in some places amounts to 2000 or 3000 feet. Equivalents to the Silurian rocks have been discovered in Belgium.

SLAVERY, (*a*.) In the body of the work, under *Slavery*, we noticed the act passed by the Whig administration for the total abolition of Slavery throughout the British colonies, and expressed a hope that we would be enabled to record, in the Supplement, the final liberation of the slave. This hope has been fulfilled by the memorable act, which was passed by parliament in 1833. The slaves were, on the 1st of August, 1834, made apprenticed labourers, to continue such, a part of them, till the 1st of August, 1840, when they were all to become completely free. To indemnify the owners of the slaves, parliament voted them the sum of £20,000,000 as a compensation, payable in certain fixed proportions, according as each colony should be ascertained to have complied with the terms of the act.

Soon after the passing of this act, the slaves in the islands of Antigua and the Bermudas were made free by the colonial governments; and acts were afterwards passed by the legislatures of Barbadoes, Jamaica, Nevis, Montserrat, St Christopher's, St Vincent, and Tortola, liberating all the slaves, or apprenticed labourers, in those islands, on the 1st of August, 1838. Movements of a similar nature took place in the other islands; and there is now not a slave left in any British colony. The following table of the Distribution of Slave Compensation money is curious.

Table, showing the average value of a Slave in each Colony; the Number of Slaves in each, by the last Registration; the total value of the Slaves; and the Proportion of the £20,000,000 to which each Colony was entitled, according to the statement of the Commissioners.

	Average value of a Slave from 1822 to 1830.			No. of Slaves by the last Registration.	Relative value of the Slaves.			Proportion of the £20,000,000 to which each Colony was entitled.		
	£	s.	d.		£	s.	d.	£	s.	d.
Bermuda,	27	4	11¼	4,203	114,527	7	5¼	50,584	7	0¾·41
Bahamas,	29	18	9¾	9,705	290,573	15	3¾	128,340	7	5¾·47
Jamaica,	44	15	2½	311,692	13,951,139	2	3	6,161,927	5	10½·58
Honduras,	120	4	7	1,920	230,844	0	0	101,958	19	7¾·92
Virg. Islands,	31	16	1¾	5,192	165,143	9	2	72,940	8	5¼·76
Antigua,	32	12	10½	29,537	964,198	8	10½	425,866	7	0¾·13
Montserrat,	36	17	10¼	6 355	234,466	8	0¼	103,558	18	5 ·38
Nevis,	39	3	11¾	8,722	341,893	6	3¾	151,007	2	11¾·35
St. Christoph.	36	6	10¼	20,660	750,840	7	1	331,630	10	7¼·82
Dominica,	43	8	7¾	14,384	624,715	2	0	275,923	12	8¾·30
Barbadoes,	47	1	3½	82,807	3,897,276	19	0½	1,721,345	19	7 ·87
Grenada,	59	6	0	23,536	1,395,664	16	0	616,444	17	7 ·03
St. Vincent,	58	6	8	22,997	1,341,491	13	4	592,508	18	0¼·93
Tobago,	45	12	0¼	11,621	529,941	16	2½	234,064	4	11¾·55
St. Lucia,	56	18	7	13,348	559,890	10	4¼	335,627	15	11½·19
Trinidad,	105	4	5¼	22,359	2,352,655	18	0¼	1,039,119	1	3¾·11
Brit. Guiana,	114	11	5¾	84,915	9,729,047	13	5¼	4,297,117	10	6¾·30
C. of G. Hope,	73	9	11	38,427	2,824,224	7	9	1,247,401	0	7¼·76
Mauritius,	69	14	3	68,613	4,783,183	15	3	2,112,632	10	11¾·06
								Defic. fractions,		·06
Total,				780,993	45,251,738	15	10¾	20,000,000	0	0

SOLAR RAYS. We take the opportunity afforded us under this head of making a few remarks upon the concentration of the sun's rays by burning glasses, with the view to explain more clearly than our previous articles have done, the *rationale* of their fusing power. If the reader refers to *Burning Lens*, and *Speculum*, he will find nothing to determine the power beyond the long recognized law that the density of the foci in any two lenses is *directly* as the areas of the glasses, and *inversely* as the squares of the focal length. Experience shows, however, that this law is insufficient to determine the fusing power; for if we take lenses perfectly proportional in area and focal length, we get focal images of *equal intensity*, which notwithstanding *act very unequally* on the substances exposed to them. In Lardner's Cyclopedia, vol. 19, p. 131, we find the following remarks by Brewster, illustrative of what we have just mentioned, and serving at the same time to show that the different powers of images *in*tensively the same, but *ex*tensively different, are at the present day regarded as inexplicable phenomena:

"M. Buffon found that a convex lens, of long focal length, was preferable to one of a short focal length for fusing metals by the concentration of the sun's rays. A lens, for example, 32 inches in diameter, and 6 *inches* in focal length, with the diameter of its focus 8 lines, melted copper in less than a minute; while a small lens, 32 lines in diameter, with a focal length of 6 *lines*, and its focus $\frac{2}{3}$ of a line, was scarcely capable of heating copper."

This passage does indeed relate an inexplicable phenomenon unless we exchange the italics for 6 *feet* and 6 *inches;* for never had lenses such marvellous foci before. Our correction agrees with the proportion between the focal length and the diameter of the focal image, which is 108 : 1. We are surprised to hear Sir D. Brewster speak of *focal length* as the measure of burning power: in the present case, it would have been more philosophical to have said, that M. Buffon found a convex lens of large surface much preferable to one of small surface, when the surfaces, foci, and focal images of the two were strictly proportional.

Now according to the law before named, the burning power of these two lenses should be the same. Let P equal the power of the larger lens, and p that of the smaller one.—

Then $32^2 : \overline{32 \div 12^2} :: 6^2 : 72^2$

And $P : p :: \overline{32^2 \times 6^2} : \overline{\overline{32 \div 12}^2 \times 72^2}$

That is $P : p :: 36864 : 36864$ i. e. as 1 : 1.

Buffon, however, found that the fusing power was incomparably greater in the larger than in the smaller lens. How then are we to account for this difference of action? We naturally look to the relative magnitudes of the focal images; and a little consideration will assure us, that though their intensity is the same, *space for space*, the largest image must produce considerably more effect than the other; *because* the heat at the centre of the large image cannot be dissipated, or conducted away, nearly so rapidly as the heat at the centre of the small one. If we are not mistaken, the fusing power of the focal images formed by the two lenses quoted by Brewster, is *directly* as the squares of the radii of the images. Hence we say:—

$P : p :: 4^2 : \frac{2}{6}^2$

That is, $P : p :: 16 : \frac{4}{36}$ or 144 : 1.

Mr Pritchard, one of the first authorities of the day in all optical matters, remarks, in a recent letter to us,—"With respect to burning lenses, it appears to me that no experiments have been made with sufficient accuracy to deduce a *formula* from them." He then alludes to the observations of Herschel and Goring in the "Micrographia," regarding focal images: we do not, however, find in them any thing that goes beyond the established law stated at the commencement of this article. Under present circumstances we offer our formula for determining the intensity, as an incentive to accurate experiment by which alone it can be properly tested.

SOTHEBY, WILLIAM, a gentleman of liberal fortune and education, who distinguished himself by his poetical translations, was born in London on the 9th of November, 1757. By the death of his father, when only seven years old, he was left under the guardianship of the honourable Charles Yorke, afterwards lord Chancellor, and of his maternal uncle, Hans Sloane, Esq. By them he was placed at Harrow, where he remained till the age of seventeen, when that active disposition which accompanied him through life induced him to enter the army, instead of completing his education at either of the universities. He purchased a commission in the tenth dragoons, from which he immediately obtained leave of absence, and passed several months at the military academy at Angers, for the purpose of more fully studying the principles of his profession. On quitting Angers, he spent the following winter and spring in the brilliant societies of Vienna and Berlin, and, returning through the South of France to England, rejoined his regiment towards the close of 1777. Upon his marriage in July, 1780, he quitted the army, and purchased Bevis Mount, near Southampton, where he continued to reside for the next ten years.

He now principally devoted his time to the diligent study of the classics, to the translation of many of the minor Greek and Latin poets, and some original compositions, which his maturer taste did not deem worthy of publication. In 1788, he made a pedestrian tour through Wales, which gave rise to some odes and sonnets, with a poetical description of that romantic country, published in 1789, under the title of "A Tour through North and South Wales." In 1791, he removed to London, and from this time made the metropolis his principal place of residence. He was now elected a fellow of the royal and antiquarian societies, and became a member of the Dilettanti, and several other literary and scientific meetings. At his own house he was also in the constant habit of receiving persons of talent of all parties, both in politics and in literature, where the warmth of his manner and cheerful tone of his mind, threw a peculiar charm over the society. In 1798, he published a translation from the Oberon of Wieland, which became immediately popular; and in 1799, a poem on the battle of the Nile.

In 1800 his well-known translation of the Georgics of Virgil appeared. In 1801, his love of the fine arts prompted him to address his friend Sir George Beaumont, in "A Poetical Epistle on the Encouragement of the British School of Painting." In 1802 he first published the tragedy of "Orestes," on the model of the ancient Greek drama, accompanied by a mask entitled "Huon de Bordeaux," founded on the poem of Oberon, and interspersed with many elegant fairy songs adapted to the music of Viotti. In 1807, he published an original sacred poem, in blank verse, under the title of "Saul." His next work was of an entirely different description, being principally suggested by the admiration he felt, and the pleasure he derived, from the perusal of the poetical writings of Scott, which induced him to compose "Contance de Castille, a metrical Poem in ten cantos," published in 1810: many of the descriptive passages, and the spirit of the whole, will show that he was not an unsuccessful imitator of the romantic style of "Marmion," and "The Lady of the Lake," then in the first freshness of their justly deserved popularity. In 1814 he republished the "Orestes," together with four other tragedies, one of which, called "Julian, or the Confession," had already been represented at Drury Lane; and in 1815 a second corrected edition of "The Georgics, with notes," appeared.

In 1816–17, accompanied by his family, he passed eighteen months in travelling through France, Switzerland, and Italy, returning by Germany. This tour gave rise to a series of poems, many of which were composed on the spot, or addressed to some of the celebrated individuals with whom he associated during his travels; but, owing to a variety of circumstances, they were not published till some years after, under the title of "Italy." After his return he employed himself in revising his translation of the Georgics, and preparing for the press a folio edition, published in 1827, containing the original text, and the translations of De Lille, Soave, Guzman, and Voss, together with his own. The summer and autumn of 1829 he spent in Scotland, about which time he undertook a translation of the Iliad and Odyssey. Early in 1831 the first edition of the translation of the Iliad was published: and during the following year he completed that of the Odyssey, and corrected his version of the Iliad, preparatory to a second edition. He lived to see this most favourite employment finished and ready for publication, embellished with engravings from the classical and elegant designs of Flaxman. His death took place on the 30th December, 1833, in the seventy-seventh year of his age.

SOUND. Mr William Shand has favoured us with the following observations, which are in part extracted from a series of essays in the Medical Gazette, commencing the 15th December, 1838, and intended to illustrate the agency of sound in the stethoscope and the human ear.

Sir John Leslie observes that the doctrine of sound is the most subtile and abstruse of any in the whole range of physical science, and it must be admitted that until a certain sequence of leading facts, and of the principles by which it is governed, shall be ascertained, every attempt to arrive at practical utility must in a great measure fail, and can by possibility only succeed in a very limited degree.

I consider the following to embrace several of the principles or laws which govern the phenomenon of sound, and as the only mode by which these could be ascertained. I have endeavoured to trace its operations in different bodies from its origin externally to the nerve of hearing, which is the last vehicle of communication with the brain. The two actions, and the laws by which they are governed, are not alone material to the science of acoustics, as regards the economy of speech, or the agency of sound in the organ of hearing; but until these shall be understood and acted upon, perturbation and derangement must prevail in all mechanism in a state of motion, from the magnetic needle that defines our position on the globe, and points out the mariner's way, to the ponderous train and the metallic chords of the railway, which support and guide its course.

1st. Sound is usually produced in bodies more dense than the atmosphere, by sudden percussion, and the action of one body upon another; and it is considered to be the result of different modifications of matter only.

2nd. Rapid agitation, causing the atoms or crystals of a solid, by their extremities to act upon each other, creates sound, *whether this action be occasioned by original impulse or by reflection.* It is regulated by the principles of attraction and repulsion; and it cannot be produced, conducted, or reflected, in any case, without being preceded by vibratory action.

3d. As the atoms or crystals of solids vibrate repeatedly, and ultimately return to their primitive positions, they produce more intense and continuous sound than fluids, the component parts of which pass each other and do not return to their original positions.

4th. In conformity to the density of the atoms, their form, and the medium distance between them, is the intensity, duration, and velocity of sound.

5th. As all sonorous bodies, whilst they conduct, or reflect, also create sound, it is obvious that to preserve the original character of sounds, the reflecting or conducting body must in its movements accord in time with those of the body which produces or forms the original sound.

6th. As vibration is necessary to produce, conduct, or reflect, every still body must arrest sound, on the same principle that a body at rest, being in contact with a wheel moving round its axis, impedes its progress.

7th. Slow pressure compresses a few atoms only, but rapid percussion occasions action, reaction and sound, throughout hard bodies.

8th. A solid, to produce much sound without great impulse, must be of limited diameter in one direction, for it vibrates most in this direction, because the atmosphere yields more than the solid.

9th. In every sonorous body there are two different actions—the tremulous or vibratory action, *which mainly creates sound;* and the undulating or oscillating motion, which consists of a certain number of atoms moving together.

10th. The undulation or oscillation by separating the action of the atoms, also determines the duration of each distinct sound in a body, and in the organ of hearing. In a string the nodal point which separates the waves is easily defined, but in an expanded thin body the termination of the wave varies according to the form of the body, and is not easily perceptible, and it is frequently irregular in action and sound, so as to produce confusion in the ear.

For the reasons given, if a rod be struck on the end, or a thin expanded body on the edge, little sound is produced.

11th. The chief distinction between hard solids and fibrous substances is, that the latter possess more of the adhesive and less of the repulsive principle; they require to be more distended in a longitudinal and superficial direction; and intensity of sound is more by the extent of their excursions than molecular action.

12th. Fluids are more powerful conductors than productors of sound, but conduct less rapidly than solids. Their atoms or component parts pass each other, and do not return to their original places as do those of solids; this accounts for sound passing in all directions in the atmosphere, but most in the direction in which most impulse is given; *also why the same degree of percussion produces more sound in hard solids than in the atmosphere;* and why in transit there is less change in its original character.

13th. Sound is much influenced by moisture in the atmosphere. Intensity and distance of transit are regulated more by the adjustment of particles than the proportion of moisture. For instance it is loud and passes furthest during frost, and at all times when objects are seen to a great distance. This is peculiarly perceptible within the tropics, and in this country in summer just as the sun sinks under the horizon; but when cold increases and the particles of moisture become larger, these effects are diminished. It follows as a matter of course, that its transit must be more or less rapid under such varying circumstances.

14th. Water conducts more powerfully and rapidly than the surrounding atmosphere, and, so far as I have been enabled to ascertain, with increased effect as it approaches the temperature of the human body. This is exemplified in tropical rivers and in the human ear, where this fluid is the only body in contact with the nerve of hearing, to which it must communicate sound consistently with its original character.

Sound is not produced by the atmosphere alone, without violent concussion, or being in contact with a more dense medium. Being the offspring of atomical action in bodies, and in degree of intensity in the ratio of their adhesive and repulsive principles, it cannot be produced in a vacuum, nor in a still body; but the latter may, by concentrating or confining a fluid, increase action and sound for a limited time after a certain impetus has been given to the fluid, in like manner as a stream of water is increased in velocity by being confined. As it not only operates differently in every different substance, but undergoes certain change in intensity or the nature of sound by every change in the molecules or surface of any mass of matter, there are no limits to the various effects that are produced by such changes.

In all cases it is difficult to reason upon the operations of nature and the motions and influence of matter not perceptible to the eye. In the present case, however, we are enabled to judge partly by our ocular faculty, and in part from our sense of hearing.

That the vibratory and undulatory or oscillatory actions are not only prevalent in the musical string, but in all matter in a state of agitation, is indicated by the following facts. In a musical string of given diameter and tension, when set in motion, the extent of the undulations are in the ratio of the length of the string; each undulation gives out a distinct sound, conformable in duration to the extent of the undulation. The cause of the separation in the sounds, and that each continues just so long as the motion continues, is demonstrated by the simple fact, that if any light small material be placed on the nodal point between the undulations, it remains on the string; but if placed on the wave, it is thrown from the string. In the flat brasses in a musical box it is regulated in like manner, but differing somewhat in the undulations; because in the former case the string is fixed at both ends from which there is a more determined reaction, while the vibrating brasses are fixed at one end only. Similar action is apparent in a common rope or cord, when stretched on the ground, in order to define a straight line for any purpose; the line is stretched by a vertical motion of the hand, a single motion of which produces many undulations in the cord, in number in conformity to its length. The same principles of action are exhibited in aqueous fluids, in the atmosphere, and in solids of great expanse.

In the ocean, sound continues just so long as a wave is in motion, and the greatest run of sea, and elevation and extent of wave, is exhibited where there is a deep indent in the land. Were the motion of the water in this case ruled alone by the current of air, on its surface, the waves would move uniformly in the same direction; but this is not the case.

These circumstances are, however, most perfectly defined by the atmosphere, because sounds are by it transmitted in all directions with the least change in their original character, and if analogical reasoning is to be applied in this case, and it be admitted that sound is only produced by the action of bodies on each other, and ceases the instant these become still, in it there must be spherical intervals at rest during vibratory motion, in order to keep apart sounds in conformity to their original formation.

Thus the Creator has adjusted and regulated the atmosphere for these purposes, but in all artificial materials it is left for man to economize his arrangements.[*]

In order to demonstrate that predominant sounds are conducted by the fibre of the wood of which the stethoscope is composed, I have made various trials with this instrument on the human ear, and advanced many experimental facts, to prove that the tremulous and sonorous pulsations of the atmosphere are not, as has been universally believed, collected on the superior surface of the auricle or pinna of the ear, and conducted by what is termed the auditory canal to the membrana tympani or pelt of the drum, and thence through the central cavity of the ear to the labyrinth, but must necessarily operate by the vibratory pulsations of the atmosphere impinging upon and producing vibration in the pinna, which is a fibro-cartilagenous lever and fulcrum, and that it is conducted by the solids and denser fluids that surround the auditory passage and tympanic cavity to the labyrinth. To confirm this theory, the following facts are important.

1st. It appears to merit particular notice, that notwithstanding sounds reflected on a speaker occasion great fatigue and exhaustion, arising, I suppose, from their influence on the mouth and parts adjacent, this should take place while the external ear is supposed to be without vibratory action, when the form and peculiarly elastic properties of the pinna are considered.

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[*] In reasoning on this abstruse subject, I have been averse to oppose whatever has been uniformly propagated and received as truth to demonstration; but after much consideration, I believe that vibration and sound operate most influentially in the atmosphere, in a vertical direction, and least towards the earth's surface, mainly from the facts, that sound from underneath, striking within a vertical arch, produces louder and more prolonged reflections than when it operates within a horizontal arch. This is peculiarly perceptible in speech, in which the vertical curvature prolongs sound so as to mar articulation more than a horizontal curvature. This I shall illustrate more fully in an Essay, now in the course of progress for the Medical Gazette.

2nd. Wherever matter is at rest, sound ceases; consequently that part of the ear which the atmospheric pulsations reach before they arrive at the membrana tympani, cannot be still.

3d. When one individual listens to another who is addressing him, his face is turned towards the speaker, so that sound is received upon the ear from in front.

4th. There is then in front and centre of the auricle, a small angular projection, called the Tragus, which covers the auditory passage, and throws the wave of sound over it, and this orifice forms an acute angle to the approach of sound. On the extremity of this promontory, there is a growth of hair, which must break and divide sound before it can enter the aerial passage.

5th. At the entrance of this passage there is also a growth of hair, partly strong and in part downy and soft, the former calculated to break and divide sound, and the latter to damp it.

6th. This auditory passage is lined with cerumen, a soft yielding body that must damp sound, and it is also found on the membrane of the tympanum, which consists of three distinct folds, the anterior membrane or fold being a continuation of the cuticle skin of the auricle and auditory canal; consequently sound is as much influenced by all these deteriorating and deranging properties as would be the case in any musical wind instrument, if its anterior surface were lined by similar materials.

7th. In regard to the superior surface of the auricle on which sound is supposed to be collected, it may be remarked that this has no definite formation; it varies more in different individuals than any other external part of the human body, and is neither intended to conduct or reflect with consistency, as the ear, like the atmosphere, must transmit sound without change in its original character.

8th. Sound, on passing over the Tragus, must in some cases act mainly on the antehelix, the first projection, and in other cases on the helix or rim of the pinna, according to the degree of elevation in the one or the other, but more commonly on both these elevations, and must be reflected in order to reach the concha at the entrance of the auditory canal, the concha being spherical, and in its form inimical to the preservation of articulate sounds, if we are to judge by external bodies.

9th. This expanded lever with its fulcrum being composed of the same materials as the windpipe, is powerfully elastic and sonorous, and must reflect irregular sounds from its sinuosities and deep recesses.

Were the membrana tympani powerfully sonorous from its tension and extreme attenuation, action and sound would, as in similar external bodies, be prolonged so as to bring the sound of one letter upon another in speech, and consequently confuse.

The chain of bones in the central ear is divergent in various parts, and incapable of conducting regular sounds, and the two membranous spaces in the bony partition between the central and internal cavities of the ear, (termed the fenestra) one being elliptical and the other circular, must produce different sounds; these, together with the small aerial canal which connects them, lately discovered and described by M. Savart, and also by Dr Todd in the Cyclopedia of Anatomy and Physiology, are longitudinally transverse to the direction of the nerve of hearing, and the lining of the vestibule and cochlea with which they are connected, must derange sound transmitted in this direction, although by means of their contact with the membrana tympani a slight degree of action in the aqueous fluid in the labyrinth may be produced, and an effect similar to what is experienced when a light current of air brings the sound of the church bell to our ears with increased effect.

Not any of these impediments, however, operate to prevent sound after the atmospheric wave impinges on the pinna, from being conducted to the labyrinth by the solids and denser fluids which compose the organ of hearing, *and are more potent and rapid conductors than common air.* That consonance prevails in this direction is sufficiently proved by the application of the stethoscope to the gristle of the pinna; but the preconceived fancy that air is the predominant agent by which sound must enter this organ and operate upon the membrane of the tympanum, having been indulged and impressed on the mind from generation to generation, is not easily removed, and yet it is of akin to the limited and erroneous notion which so generally prevails, that in order to regulate and economise speech in apartments, it is only necessary to take into consideration the mere form of an apartment, and not the nature and influence of surrounding solids.

SPENCER, THE RIGHT HON. GEORGE JOHN SPENCER, SECOND EARL, was born on the 1st September, 1758, and received the early part of his education under the tutorage of Mr (afterwards Sir William) Jones. After prosecuting his studies at Harrow with great assiduity, his lordship was entered at Trinity college, Cambridge; and in 1778 he took the degree of bachelor of arts. Throughout the term of his intercourse at the university he attracted around him many friends, whose esteem he acquired not less by the dignified tone of his mind than by the generosity of his disposition. Shortly after he left college, he took his seat in parliament for the borough of Northampton, and being connected by association as well as principle with the whigs, his lordship attached himself at once to that party. The moment was auspicious for the display of firmness and ability. The whigs were engaged in a struggle with lord North, and lord Althorp was one of the majority that drove the minister from the power he abused. On the overthrow of that administration his lordship was appointed, in 1782, one of the lords of the treasury, and was re-elected for Northampton, though he was afterwards elected for the county of Surrey, which he continued to represent until he succeeded to the peerage, by the death of his father, in 1783. The state of the public mind upon the progress of events in France a few years after called his lordship into a more important position. The principles that were rapidly growing up amongst the French people were regarded in this country with the utmost anxiety. A change had taken place in the government, and the whigs were again at the opposition side of the House. The whole of the year 1792 presented an unbroken series of alarms. The whigs had become divided upon the wisdom of the measures adopted by the administration; and a section of them considered it to be their duty to support the existing government. Lord Spencer, with the duke of Portland, lord Grenville, and Mr Windham, joined the Pitt administration in

1794. He was appointed, on the 20th of December in the same year, to succeed lord Chatham in the high and important office of first lord of the admiralty, and immediately directed the whole energies of his mind to carry on with vigour the naval operations of the country. The brilliant victories which followed afford the best evidence of the great ability and distinguished success with which he presided at the admiralty. It was in the selection of men for command that lord Spencer exhibited his discrimination and judgment; he called into action the talents of Jervis, Duncan, Nelson, Hood, and Hallowell; and the victories of St Vincent, Camperdown, and the Nile, adorn the naval annals of that eventful period. He was also an enlightened and liberal patron of those ingenious men whose suggestions and inventions have contributed to improve the construction and equipment of ships. Among these we need only mention Brunel, at that time little known, and whose genius he was among the first to perceive in the invention of that beautiful and most effective piece of mechanism the "block machinery." His lordship has all the credit of its erection at Portsmouth: although he left office too soon to see it carried into execution, he introduced Brunel to his successor, lord St Vincent, to whom he so strongly recommended the project, that it was executed in 1802.

In 1801 a change of ministry took place. Lord Spencer retired with his immediate friends, and the Addington administration came into office. He renewed his political connection with lord Grey and Mr Fox, and from that time till the day of his death he continued cordially to support the measures of the whig party. When Mr Fox was called to assume the government in 1806, lord Spencer accepted the office of secretary for the home department. Upon the death of Mr Fox, the administration being dissolved, his lordship's official life terminated. He continued, however, to attend in his place in the House of Lords, took part occasionally in the debates, and when lord Grey came into office at the close of 1830, he gave that noble lord's government his full and entire support. In bibliographical knowledge lord Spencer was justly considered equal to any man of his time; and the noble library which he collected at Althorp and of which Dr Dibdin published a splendidly illustrated catalogue, ranks among the most perfect and valuable of its kind in Europe. He was a fellow of the royal society, and was among the number who established the royal institution, of which he was chosen the first president, and continued so for many years. He was connected with many other societies; and wherever his patronage could be of use in promoting and extending literary or scientific knowledge, it was liberally and munificently given. The Earl married, in 1781, the honourable Lavinia Bingham, eldest daughter of Charles, first lord Lucan, and by her had issue John Charles, lord Viscount Althorp (now Earl Spencer); Lady Sarah, married to lord Lyttleton; the honourable Sir R. Cavendish Spencer of the royal navy, and K.C.H., who died in 1830; Lady Georgiana Charlotte, married to lord George Quin; the honourable Frederick Spencer, M. P., and captain in the royal navy; and the honourable George Spencer, in holy orders in the church of Rome. Surrounded by a family affectionately devoted to him, this venerable nobleman, after a short but severe illness, expired at Althorp, on Monday, the 10th of November, 1834. Though he took a decided line in politics, differed from many of his friends, and accepted office with his former opponents, yet such were his high character and stainless honour that the probity of his motives was never questioned by those who condemned his decision. In person lord Spencer was tall; in his deportment eminently courteous, affable, and kind. His countenance was thoughtful, and could be severe; but in the circle of his family and friends it was lighted up with a benignity of expression which truly bespoke the benevolence of his heart. His habitual temper was in the highest degree cheerful, enjoying every thing—eager in all its pursuits, and delighted with witnessing the happiness of others.

STOCKTON-UPON-TEES; a town in the county of Durham, situated near the confluence of the Tees with the German ocean, 242 miles from London, and 36 S.S.E. from Newcastle. It is a place of considerable antiquity, though its early history is obscure. It consists of one principal street half a mile long, and several smaller branch streets. It is well paved and lighted with gas. The town-hall, in the centre of High street, is a handsome and commodious building. The commerce of Stockton extends to Holland and the ports of the Baltic, and coastwise to London, Hull, Leith, Sunderland, Shields, &c. The first shipping company established in the port of Stockton took the name of the "Union Shipping Company"—it was formed in 1822; the second, called the "Commercial Shipping Company"—the third, the "General Shipping Company"—and the fourth, the "North York and South Durham Shipping Company"—were formed in 1834. These companies have all been prosperous. The manufactures of Stockton and the contiguous district comprehend sail-cloths, cordage, damask, diapers and towelling; there are ship and boat building yards, spinning and corn mills, iron and brass foundries, and several breweries. A railway from Darlington to Stockton was completed so early as 1825, and is of vast advantage to the town; but the Tees has been and is the main source of its progressive prosperity, abounding with excellent fish, such as flounders, eels, smelts, &c.; the principal fishery, however, is that of salmon. The port is a member of that of Newcastle-upon-Tyne, and it was made a bonding port for certain goods in 1815. About three miles from the town are excellent quarries of blue stone, used for repairing roads; and coal mines are at the head of the railway. By the municipal reform act passed in 1835, the government of Stockton was vested in a mayor, six aldermen, and eighteen councillors. Population in 1841, 31,339.

STOTHARD, THOMAS a distinguished painter and designer in the higher walks of the art, was the son of a vintner in Long Acre, London, where he was born on the 17th August, 1755. When he was of a proper age, he was bound apprentice to a pattern drawer for brocaded silks; but that fashion so completely declined that, his master having died, the widow gave up to him the last year of his apprenticeship. In this art, however, he had minutely studied nature, in the drawing of flowers and other ornaments; and took every opportunity of improving that knowledge by little trips into the country by both land and water. During his apprenticeship, being a favourite with his mistress, he used to employ his spare hours in making drawings for her; some of which were arranged along the chimney-piece of her parlour. It chanced that in the course of business, a gentleman who saw these drawings was struck with them; and putting some questions as to the artist, was told they were by one of the apprentices, who had made a great number. The gentleman took some of the drawings away with him; and having shown them to a publisher of that day with whom he was intimate, this led to the employment of the young artist in making drawings for the booksellers. Mr Harrison, the well known publisher in Paternoster Row, was, we believe, the earliest employer of Mr Stothard. Many of the engravings for "The Town and Country Magazine," between 1770 and 1780, are from drawings by Stothard, but there is no name to them. Shortly afterwards he became more known by the exquisite little designs he made for Bell's "British Poets," and the "Novelist's Magazine;" some of which procured for him the friendship of his eminent contemporary, Flaxman. Sir Joshua Reynolds also was so struck with his talents that when he was requested by Sir John Hawkins to design a frontispiece for Ruggle's Latin play of "Ignoramus," he said, "There is a young artist of the name of Stothard who will do it much better than I can; go to him."

His designs at this period formed an era in British art, and created a new taste in the public mind. They were also productive of a more laboured and beautiful style of engraving than had till then been seen in embellishments to printed works. Mr James Heath was to Stothard what Bartolozzi was to Cipriani; transferring his designs to copper in a manner worthy of them, preserving the character and spirit of the originals, and at the same time investing them with the grace and brilliancy of a finished work. Most of the embellished volumes published during the last half century were illustrated by the inimitable compositions of this truly poetic painter, and they form a monument, not to his own fame only, but to that of the country which gave him birth. The number of his productions of this class cannot be less than five or six thousand. His series of sketches for "Robinson Crusoe" are among the happiest of all his works of that class, and his designs to illustrate "The Pilgrim's Progress," engraved by Strutt, are singularly beautiful. His illustrations of "Don Quixote" and "Gil Blas" are full of humour. Among the most beautiful of his more recent designs were his illustrations of Mr Rogers's "Italy," in which he could not have been more successful if he had passed his life in that luxurious clime.

The easel pictures of Mr Stothard were few compared with his designs for books and other publications; but they were abundantly sufficient to establish his reputation as a painter. And first, both for originality and character, should be placed his "Canterbury Pilgrims." It was Mr Cromek who commissioned Mr Stothard to paint this fine picture. An engraving from it was made, but the completion of the plate was long delayed. The two engravers originally employed, Louis and Philip Schiavonetti, as well as Mr Cromek himself, paid the debt of nature during its progress; and it was eventually finished by Mr Heath. The painting was afterwards bought by Hart Davis, Esq. A copy, with some variations, was made for a gentleman in Yorkshire of the name of Benson, who also purchased Mr Stothard's "Characters from Shakspeare." The Decameron of Boccacio supplied Mr Stothard largely with the romantic scenes of ladies and lovers strolling, as vagrant fancy or accident directed, amid rustling groves, running streams, and sunny knolls, which were his especial favourites. The largest painting ever executed by him is the grand staircase at Burleigh, the seat of the marquis of Exeter. This splendid work was commenced in the year 1798, and occupied the artist for the four summer months of four successive years. The subject is intemperance; the principal group consisting of Marc Anthony and Cleopatra, surrounded by sylphs, bacchanals, &c. Mr Stothard also designed the ceiling of the advocates' library at Edinburgh; and, among other commissions, he was called upon to furnish designs for the basso-relievos of the grand staircase of Buckingham palace, in which style of decorative ornament no man was better skilled. There is good reason to believe that some of the most distinguished works of English sculpture, produced in Mr Stothard's time, have owed their origin to his designs; and the chasers in gold and silver, particularly those employed by Messrs Rundell and Bridge, and Messrs Green and Ward, were continually indebted to his creative art. In his design for the Shield of Achilles, he evinced a thorough knowledge of early Greece; in his design for the Wellington Shield, the bearing of an English officer is given in the most masterly manner. Of the latter he made an elaborate etching with his own hand. One of the last of his productions of importance was a drawing which he made of the procession of the Flitch of Bacon, which was finely engraved by Mr Watt.

Mr Stothard's style was certainly mannered; but in character and expression truth and nature ever prevailed. He was not without a sufficient skill in colouring; and where bright and vivid tints were required by the nature of his subject, he found no difficulty in producing them. In some of his works there is an evident leaning towards the olden and Albert Durer times of art. Like his friend Flaxman, he was fond of studying the ancient monuments in Westminster Abbey, many of which are in the purest style of composition. Nor does it detract from his merit, or from the character of his genius, that he occasionally transfused the spirit of some of the most distinguished masters into his pictures; for he did so without losing an iota of his own originality and invention. There are not wanting examples among the works of Mr Stothard in which the grace of Raphael, the gaiety of Watteau, and the fire of Rubens, may be unequivocally recognised. His works are of two classes,—those which illustrate poetry and prose, and those which embody his own sentiments and conceptions: the former are the more numerous, but some of the latter are the most felicitous of his pictures, and please us with unlooked-for loveliness, and unexpected beauty. His excellence was the same in every department of composition whether serious or comic, domestic or imaginative, pastoral or sublime. He never painted pretty pictures to please the eye; his productions always appealed to the mind. Though humour and pathos flowed alike from his pencil, his humour never degenerated into caricature, nor his pathos into affectation or insipidity. There is scarcely an author of any note whose pages he has left unembellished; nor is there any poet whose excellence he can be upbraided for not feeling.

As a man, his character was simplicity itself. He was always liberal in opening the rich stores of his knowledge to all who stood in need of his aid. Never was there a less assuming or more disinterested individual. He hated all collision with bustling arrogant men, and took care to avoid them. His voice was low and not unmusical: he abounded in anecdote; and with those to whom he could unbosom himself was one of the most agreeable companions breathing, for his observations on men and manners were always shrewd and intelligent. He was an early riser, loving to walk into the streets to look at the various classes of the toiling community hurrying to their work: this was one of his places of study; he made sketches of labourers and artisans, singly and in groups; nor did he fail to include flower-girls, and all such moving dealers as London finds employment for.

When young, he studied with great diligence at the royal academy. The first picture he exhibited was "Ajax defending the body of Patroclus;" and the walls of Somerset house were subsequently enriched during a long course of years by his works. He was elected an associate of the royal academy in 1785, and a royal academician in 1794. In 1810 he was appointed deputy librarian; and on Mr Burch's death, in 1812, succeeded him as librarian. On becoming a painter by profession, he took apartments in the Strand, opposite Somerset House, but for above the last forty years of his life he resided at No. 28, Newman street. He died on the 29th of April, 1834, in the seventy-ninth year of his age. He left a large family of children, some of whom have distinguished themselves in the arts.

STOURBRIDGE; a town in the county of Worcester, 122 miles N.W. from London. It derives its name from its situation on the Stour, over which is a bridge, connecting this county with that of Stafford. The manufactures of Stourbridge are considerable, particularly in glass, iron, cloth, and bricks. The glass manufacture was established here when it was first introduced from Lorraine, in 1557. Drinking glasses, window-glass, bottles, and fine stone pots and crucibles of superior excellence are here made. The iron manufactures consist chiefly of the making of nails, agricultural implements, &c.; and the quarterly general meetings of traders in iron are held at Wolverhampton, Birmingham, and Stourbridge, on their respective market days. In the neighbourhood of this place are several mines, which produce coal, iron, stone, and clay; which last, from its use and excellence in the manufacture of glass, is considered the best in the world. At the free grammar-school of Stourbridge, Dr Johnson received the rudiments of his education. Population in 1841, 7481.

STOWELL, the right Hon. William Scott, LORD, judge of the high court of admiralty, was the eldest son of William Scott, a coal merchant of Newcastle-upon-Tyne, and was born in 1745, the year of the Scottish Rebellion, at Heworth, in the county of Durham, his mother having been conveyed to that place on account of the alarm occasioned by the approach of the rebels to Newcastle. Lord Stowell, as did his younger brother John (afterwards the earl of Eldon, and lord chancellor of England), received the rudiments of his classical education at the grammar school in Newcastle. He was graduated, in 1764, A.B. at Corpus Christi college, Oxford; in 1765, was admitted fellow of university college, also the same year appointed a tutor; in 1773, was elected reader of ancient histories; in 1779, he took the degree of D. C. L., and soon after he commenced his career as an advocate in the civil law courts, and rapidly rose to the highest eminence. He was knighted in 1788; in 1798, he became judge of the high court of admiralty; in 1790, he was elected M.P. for Downton, and in 1801, for the university of Oxford, which office he continued to fill till he was called to the house of Lords; and in 1821, he was created a peer by the title of baron Stowell.

In 1828, lord Stowell retired from his station as judge of the court of admiralty, having performed the duties of the office for thirty years with great ability and reputation. He died on the 28th Jan. 1836, aged ninety-one. Devoting his brilliant talents and extraordinary acumen to the noblest branch of his profession, the study of international law, and living in times when a general war called all this knowledge into action, his decisions have passed into precedents equal, if not superior, in authority to those of the venerable founders of the science, Puffendorf, Grotius, Vattel, &c. Lord Stowell was intimately associated with several very eminent men of the past age. In 1778, he became a member of the "Literary Club," which then numbered among its members Dr Samuel Johnson, Sir Joshua Reynolds, and Edmund Burke; and Dr Johnson, just before his death, in 1784, appointed him one of his three executors, the other two being Sir Joshua Reynolds and Sir John Hawkins. Lord Stowell is represented to have been the charm and ornament of every society of which he formed a part.

SUDBURY, formerly called Southborough, a town in the county of Suffolk, situated on the river Stow. It was the first place occupied by the Flemings, who came over to this country at the invitation of Edward III., and who were the first who introduced the woollen manufactory into England. The town contains three handsome churches, and its houses are tolerably well built. Before the reformation, it had a priory of Benedictine monks, subordinate to the Abbey of Westminster; a priory for canons of the order of St Augustine, founded by Simon, the archbishop; and a hospital for poor people, founded in the reign of king John; but no remains of these ancient edifices are now to be seen. Population in 1841, 8085.

SUGAR (*a.*) The commercial and economical importance of sugar is of modern date. It was known to the Greeks and Romans, as a medicinal substance, but not as food or a condiment. Herodotus informs us, that the Zygantes, a people of Africa, had, "besides honey of bees, a much greater quantity made by men." This was probably sugar, but not brought to a state of crystallization. Nearchus, the admiral of Alexander, "discovered concerning canes, that they make honey without bees." Megasthenes, quoted by Strabo, speaks, 300 B.C., of "India stone, sweeter than figs and honey." Theophrastus, in a fragment preserved by Photius, describes sugar as "a honey contained in reeds." Eratosthenes, also cited by Strabo, and after him, Terentius Varro, are supposed to have meant sugar-canes by "roots of large reeds growing in India, sweet to the taste, both when raw and when boiled, and affording, by pressure, a juice incomparably sweeter than honey."

Near the commencement of the Christian era, sugar was first mentioned under an appropriate name and form. "In India and Arabia Felix," writes Dioscorides, "a kind of concrete honey is called *saccharon*. It is found in reeds, and resembles salt in solidity, and in friableness betwixt the teeth."

After this, so learned a man as Seneca fell back into fable on this subject. His account is this; "It is said that in India honey is found on the leaves of reeds, either deposited there by the dews of heaven, or generated in the sweet juice and fatness of the reed itself." Pliny, whose special study led him to look more carefully into the matter, gives all that the ancients knew about it, and a little more. "Arabia," he observes, "produces *saccharum*, but not so good as India. It is a honey, collected on reeds, like the gums. It is white, crumbles in the teeth, and when largest is of the size of a hazel-nut. It is used in medicine only." Afterwards Archigenes mentioned it, as "India salt, resembling common salt in colour and consistency, but, in taste and flavour, honey." Galen calls it *sacchar*, and says it was "a production of India and Arabia the Blest." The author of the "Periplus of the Erythræan sea" includes it, under the name of *sacchari*, in a list of articles, constituting the commerce between hither India, and the ports of that sea.

If the assertion, that sugar was used in antiquity as a medicament only, needed confirmation, we might find it in the fact, that the subject is not mentioned except by physicians and men of universal learning, nor with tolerable precision except by the former. None of them allude to any artificial process in the preparation of it. Ælian, about the middle of the second century, is the first who mentions the use of mechanical art in the extraction of the juice of the cane, and he is likewise the first who attempts to fix the seat of its culture. He tells us, that sugar is "honey pressed from reeds, which are cultivated by the Prasii, a people dwelling near the mouth of the Ganges."

The Jewish histories make no mention of sugar. The only sweet condiment, used by the Hebrews, was honey. But it may have been in part "honey made by men;" for the Rabbins understand thereby not only the honey of bees, but also sirups, made from the fruit of the palm-tree.

During several centuries succeeding the Augustan age, no extension of the knowledge or use of sugar appears to have taken place. It is occasionally spoken of, but to the same effect as by the Greek physicians of that age. So late as the seventh century, Paul of Ægineta calls it "India salt," and borrows the description of Archigenes.

At this time a new power appeared on the theatre of nations. The Saracens conquered and occupied western Asia, northern Africa,and southern Europe. Their empire was scarcely inferior to that of Rome, in the period of her greatest prosperity and rapacity. They pushed their conquests to the Garonne and the Rhone, to Amalfi, and the islands of the Levant and the Ægean sea.

To these ingenious barbarians the world is indebted for the modern manufacture and commerce of sugar. It is not known at what time they themselves became acquainted with it. Some authors have asserted, that it was not until the thirteenth century, and that the sugar-cane and the art of extracting and elaborating the juice were conferred upon the Europeans by the crusaders, or by the merchant adventurers, who penetrated the Indies after the return of Marco Polo. Each of these assertions has been vaguely received; but a little attention will satisfy every inquirer, that neither of them is true.

We have seen, that several of the ancients, best acquainted with the subject, couple Arabia Felix with India as a source of *saccharum*. Arabian writers of the ninth and tenth centuries speak of sugar as common in their times. In the year 906, the sugar-cane was cultivated, and sugar manufactured, at Ormuz in Caramania, a province of the eastern Caliphate. An Arabian author of the western Caliphate, who composed a treatise on agriculture about the year 1140, and who quotes another writer of his nation of the year 1073, gives full and precise directions for raising canes and manufacturing sugar. From all which Loudon concludes, that sugar has been cultivated in Spain upwards of seven hundred years and probably as much as 1000 years. Salmasius declares, in 1660, that the Arabs had made our modern sugar more than eight hundred years.

One of the Christian historians of the crusades, in the year 1100, states, that "the soldiers of the cross found in Syria certain reeds, called *canaméles*, of which it was reported, that a kind of wild honey was made." Another, in 1108, says; "The crusaders found honey-reeds, in great quantity, in the meadows of Tripoli, in Syria, which reeds were called *sucra*. These they sucked, and were much pleased with the taste thereof, and could scarcely be satisfied with it. This plant is cultivated with great labour of the husbandman every year. At the time of the harvest they bruise it, when ripe, in mortars, and set by the strained juice in vessels until it is concreted in the form of snow or salt." The same historian relates, that eleven camels laden with sugar were captured by the Christians. A similar adventure happened to Richard Cœur-de-Lion, in the second crusade. A third writer, in 1124, tells us, that "in Syria reeds grow that are full of honey; by which is meant a sweet juice, which, by pressure of a screw engine, and concreted by fire, becomes sugar." These are the earliest notices of the method of making sugar; and they refer to an apparatus and to processes used in the Saracen empire, and not known at that time, so far European records show, to be used anywhere else. At the same time sugar was made at Tyre in Syria, then subject to the Saracens; and, in 1169, that city is mentioned as "famous for excellent sugar."

The island of Sicily was the first spot upon which the sugar-cane is known to have been planted in Europe, although it is altogether likely that it was planted by the Moors full as early, if not earlier, in Spain and Portugal. That island was conquered by the Saracens in the early part of the ninth century, and was retaken by the Normans at the close of the eleventh. Immediately after that event we find, that large quantities of sugar were made there. According to records still extant, William the second king of Sicily, in 1166, made a donation to the convent of St Benedict of a "sugar-mill, with all the workmen, privileges, and appurtenances thereto belonging."

If it was the crusaders who brought the sugar culture to Europe, how happened it, seeing that they were collected from all Europe, that no other part of that continent except Spain in the hands of the Arabs, and no other island of the Mediterranean except Crete, captured in the year 823, by an expedition from Spain, were favoured with that invaluable donation? It was not until three hundred years later, that it found its way into Cyprus, Rhodes, and the Morea; and this extension was not owing to rural tastes, or the spirit of improvement among the feudal barbarians, but to the commercial enterprise of the Venetians, who had for a long time carried on a lucrative trade in the article with India, Syria, Egypt, and Sicily, and were now, by conquest or purchase, the possessors of Crete, and the later seats of the sugar culture above mentioned.

It may be further remarked, that the most important and profitable of the manufacturing arts have never been propagated except by conquest or emigration. The woollen business was established in England by the weavers, fullers, and dyers, whom the frantic tyranny of the counts of Flanders and their French allies drove, and the wise policy of the Henrys and Edwards welcomed, to England. The cotton manufacture, derived to the Arabians from Hindostan, was by them diffused over Africa, and fixed in Europe; and thence brought by an enterprising operative to the United States. It seems scarcely credible, that those half-naked, hard-riding demons, who are so often employed in stripping unfortunate Christians to the skin, are the identical people to whom Christendom is indebted for the comfort of a shirt. Such, however, is the fact. The Arabs conferred upon us that grateful, and now ornamental garment.

It was not until the time of Justinian, five hundred years after silk was known and purchased at enormous prices at Rome, that the silk culture was brought into the eastern empire by two Persian monks, who had pursued it in China. It was established in Italy by a colony of Greek captives, and carried from Milan to Lyons by a company of Italian workmen, engaged by Francis I. Finally, the Huguenots fled from treachery and intolerance to impart their skill to Spitalfield. The silk manufacture is more simple and cheap than that of sugar has hitherto been, and yet it required twelve hundred years to travel from Constantinople to London; and it has but just reached the American shores after two hundred years more.

The use of alkalies, in the clarification of the juice of the cane, was an invention of the Arabs. The original raw sugar of the East was debased by a mixture of mucilaginous matter, which opposed itself to the crystallization of the sugar, and determined it to a speedy decomposition after it was crystallized. To this day the Eastern sugar, except where the manufacture is directed by Europeans, or where the product has been converted by the Chinese into what we commonly call "rock candy," is much inferior to that of the West in purity, and in strength of grain. The only clarification which the liquor appears to have undergone in the hands of the Eastern manipulators, was by skimming during the processes of evaporation and boiling. And, if we may judge from the imperfect and loose descriptions of modern travellers, this is the extent of their knowledge at the present day. They seem to know no other method of clarification in making sugar, and no art of refining except that of making candy.

How the Arabs came to adopt a different method, it is perhaps impossible at this day to determine. Discoveries of this nature do not readily obtain publicity in any country. They are usually involved in as much mystery, and kept under a monopoly as long as possible. Another characteristic of the Arabian method was the use of earthen moulds, of a conical form, for crystallizing and curing the sugar. In the East, broad, earthen dishes were used for those purposes. These two characteristics of the Arabian method have come to us through the Spanish and Portuguese; and whence should they have derived them, except from the Arabs, Moors, or Saracens?—different names given to the same people, from the relations to places and to people, which they successively sustained. *Arabs* (according to a probable etymology of the word) means *westerns*, because this people inhabited the *west* of Asia. When they had spread over the north of Africa, and occupied the remotest Hesperia of the ancient world, the body of their nation was, in respect to the emigrants, *eastern*, and that is the signification of *Saracen*. *Moors* was a name given to them by the Spaniards and other Europeans, from the circumstance of their having conquered and converted the inhabitants of Mauritania or Morocco, incorporated them with their army, and issued immediately from their territory to take possession of Spain, Portugal, part of France and of Italy, Sicily, and the islands of the Ægæan sea.

We have seen, that the Arabs had the art of cultivating the cane, and converting it into sugar. We know that sugar-canes, called "the chief ornament of Moorish husbandry," are still cultivated in Spain, and the manufacture of sugar carried on. It is likewise made in large quantities on the river Suz, in Morocco; and, at Teycut or Tattah, constitutes a leading article of traffic with caravans, which traverse the great desert, and vend it in Timbuctoo and other markets of central Africa. Sugar is still a production of considerable importance in Egypt, particularly in the district of Fayoum, and, until lately, the Seraglio at Constantinople was furnished thence with the nicest refined sugar. In 1560, sugar was imported at Antwerp from Portugal and Barbary. At the same period it was an article of extensive manufacture and traffic at Thebes, Darotta, and Dongola in Nubia and upper Egypt. All these are undoubtedly the remains of the Arabian plantations.

The Spanish and Portuguese word for sugar, is *azucar*, *açucar*, or *assucar*, and the Arabic *assokar* or *shuker*. This was derived from the Sanscrit, *sharkara* or *sarkara*, meaning, in the primitives, *sweet salt*, and giving rise in antiquity to the terms *saccharon*, *sacchar*, *sacchari*, *saccharum*, and "India salt." The Arabic *shuker* is, with slight modifications, a universal term, except in China and the Malayan archipelago; proof enough that we received this commodity, and the art of preparing it, from neither of them, and that we and all the western nations are indebted for it to the Arabs, and through them to the Hindoos. The difference between the Spanish and Portuguese word, and other European names, is owing to the circumstance, that the two nations in close contact with the Arabs, incorporated the article *a* or *al* with the substantive, before which they heard it, as they did in a great many other instances, *algodon*, for example, which is properly *godon*, *goton*, or *koton*. The etymology of *melasses* will further illustrate our position, that we derived the art of sugar-making from the Spaniards and Portuguese, and through them from the Arabians. *Melasses*, more frequently, but incorrectly spelt, *molasses*, is an abbreviation of *mel de assucar*, signifying, in Spanish and Portuguese, *the honey of sugar*.

The Portuguese, under the auspices of Dom Henry, transplanted the sugar-cane from Sicily, as it is commonly supposed, though it might be from Portugal itself, to the islands of Madeira and St Thomas. Herrera has raised great doubt of the historical correctness of the idea, that Sicily was resorted to at that time for sugar-canes. He declares positively, that they were carried to the Africo-Atlantic islands "from Granada, where they had been planted by the Moors."

It has been a subject of much dispute, whether the sugar-cane was introduced into America from Europe, Asia, or Africa, or whether it is indigenous there. The former is the opinion of all the historians of the old world, the latter of all the explorers of the new. Edwards reconciles them by supposing that both are true, which seems to be the most reasonable conclusion. It would be as absurd to suppose, that the early European settlers of America would fail to carry that plant, with whose great value and agreeable uses they had just become well acquainted, to their new abode, especially when they were growing and were worked up in great quantities in the Canaries, whence all the adventurers were accustomed to take their departure, as it would to question the authority of the writers, who positively affirm this fact. On the other hand, it would be an extravagant stretch of incredulity to doubt the clear testimony of the many eye-witnesses, who declare, that they found native sugar-canes in Guadaloupe, St Vincent, Brazil, on the La Plata, and on the Mississippi; or the demonstration of Cook and Bourgainville, who brought a native and valuable variety from the Friendly Islands to the British and French West Indies.

It is asserted by some, that the plant was carried from Brazil to St Domingo, having been previously brought to the former from the Portuguese kingdom of Angola, where it is still cultivated, or from the Portuguese possessions in Asia, where Vasco de Gama and his successors, the conquerors of a great part of India, found sugar in abundance. Whencesoever the sugar-cane came to St Domingo, or whether it came at all, it is certain, that a company of sugar makers were carried from Palm Island, one of the Canaries, to establish the manufacture in that oldest, except Brazil, of the American settlements.

It is an interesting fact, that the art of sugar making, propagated, we must conclude, both *east* and *west* from Asia, now completed, in opposite directions, the circumnavigation of the globe; for, a few years after this establishment in St Domingo, Cortez found, that both sirup and sugar were made from the stalks of maize, by the natives of Mexico, and sold in their markets. The aborigines of Virginia, and probably of all North America, had the knowledge of making sugar from the juice of the maple. From them the Anglo-American settlers undoubtedly derived it.

In 1643, the English began the sugar-business in Barbadoes, and, in 1648, the French, in Guadaloupe. The Dutch, expelled from Brazil, where they manufactured sugar in the sixteenth century, took refuge in Curaçoa, St Eustatia, and other islands, and finally, upon the exchange of New Amsterdam for English Guiana, in Surinam. To all these they transferred a branch of industry, which they had learned to practise, and knew how to appreciate.

It is not known at what time the use of sugar began in England. It was probably as late as the fourteenth century. At that time it begins to take, in trope and verse, the place which honey had occupied, without a rival, since Moses and Homer. Chaucer uses the epithet "sugreed over." The chamberlain of Scotland, in 1329, speaks of loaves of sugar sold in that country at one ounce of silver, or about eighteen shillings per pound. In 1333, white sugar appears among the household expenses of Humbert, a nobleman of Vienne, and it is mentioned by Eustace Deschamps as among the heaviest expences of housekeeping. George Peale tells us, that sugar with wine was a common drink in the sixteenth century. It did not become an article of ordinary consumption until the beginning of the seventeenth century. At that period, the Venetians imported it from Sicily and Egypt, and probably produced it in Cyprus, Crete, and the Morea. One of their countrymen, about two centuries before, had invented the art of refining, for which he received the sum of 100,000 ducats, equal to three or 400,000 dollars at the present time. Previously to this they had pursued the Chinese method, and made candy only. This inventor adopted the cones from the Arabians, and probably obtained from their manner of clarification the idea, upon which he so far improved as to effect at last the complete purification of his product. It was from the Venetian refineries, that France and England procured their small and high priced supplies in the fourteenth and fifteenth centuries.

By the creation of sugar plantations in the Portuguese and Spanish islands of Madeira, St Thomas, and the Canaries, the stock was considerably increased. We begin then, for the first time, to have accounts of the number of sugar mills, and the quantities manufactured. Thus we are told, that in the island of St Thomas there were, in 1524, seventy mills, making on an average 66,428 lbs. each, and upwards of 2000 tons in all. It was from those islands, that Europe was for half a century mainly supplied. But the rapid exhaustion of the soil seems inseparable from the cultivation of the cane with the labour of slaves and serfs. It is reasonable to suppose, that this was the great cause of the successive migrations of this business westward, and its early decline in Sicily, Spain, and the Africo-Atlantic islands.

In St Domingo there were, in 1518, twenty-eight sugar presses. In about half a century, this island succeeded to the inheritance of the markets of Europe, which it monopolized and enlarged during a century and a half, exporting 65,000 tons in one year, being about 100,000,000 lbs. surplus, after supplying the demand of the mother country. In any possible situation of that island, it could not have maintained until this time that monopoly, and that rate of production. At the beginning of the present century, the entire exportation from the West Indies and American settlements of every description, was 440,800,000 lbs; now it is 400,000,000 lbs. from the British West Indies alone, and 700,000,000 lbs. more from Brazil and the Spanish, French, Dutch, and Danish colonies. In 1750, only 80,000,000 lbs. were exported from the British West Indies, one fifth of the present export.

Of course the consumption of sugar has greatly increased during the last half century; and it seems destined to an indefinite extension. It is so nutritive, wholesome, and agreeable, that there can never be a limit to its use except in a prohibition or an inability to buy it. Men and nations differ widely in their tastes and habits in respect to most kinds of food, sauce, and drinks. Neither wheat, rice, flesh, nor potatoes can command unanimous favour. No article of house-keeping, save sugar, can be named, which is universally acceptable to the infant and the aged, the civilized and the savage.

The population of the British West Indies is equal to that of Cuba; but their consumption of sugar was, in 1827, only 13,000,000 lbs., eighteen pounds to an inhabitant, while that of Cuba was, in the same year, 44,000,000 lbs., or sixty-three lbs. to an inhabitant. This difference is presumed to be owing to the predominance of the free over the slave population, in the latter island. The ratio of the free population of Cuba to the slave, is three to one; but in the British West Indies, one to three. This proportion would give the difference of the quantities of sugar consumed, with almost entire accuracy.

The population of all the sugar growing countries in the world is about 468,000,000. It is not to be presumed, that each individual of this number consumes as much as the luxurious West Indian; but it will not be extravagant to suppose, that they all consume as largely as the Mexicans. Mexico, by the lowness of wages, and the ignorance and poverty of the mass, may be considered as a fair representative of the nations inhabiting that belt of the earth, which produces sugar-canes. She consumes, according to M. Humboldt, ten pounds to an inhabitant, all of domestic production. We thus determine proximately, that the consumption of the other Hispano-American nations, and of the swarms which people the East, is 5,000,000,000 lbs. per annum, nearly four times as much as is used in Europe and the United States. Great Britain consumes 400,000,000 lbs., about twenty-four pounds to each inhabitant; the United States 200,000,000 lbs., sixteen pounds to an inhabitant. In Ireland, the consumption is 40,000,000 lbs., five pounds to an individual. In Russia, it is much less, being but a little more than one pound to a person, and 60,000,000 in the whole, unless the article be introduced inland from China, by way of Kiachta, as to some extent it probably is. Of the quantity consumed in Russia, we suppose 8,000,000 lbs. to be beet sugar. Belgium consumes 30,000,000 lbs., seven pounds to an inhabitant, of which 5,000,000 lbs. are beet; and Prussia, Austria, and the rest of Germany, 200,000,000 lbs., of which 20,000,000 lbs. may be beet. This is four pounds and a half to an inhabitant. Holland consumes 50,000,000 lbs., sixteen pounds to an inhabitant; Spain, the same, which is but four pounds to an inhabitant; France, 230,304,549 lbs., seven pounds to each inhabitant. Of this, 107,905,785 lbs. were, in 1836, made from beet-root. With the exception of a few manufactories in Italy, the above figures show the extent of the beet-sugar culture. Thus we have, for the total consumption of sugar in Europe, 1,267,000,000 lbs., of which 140,000,000 or 62,500 tons, are beet sugar; and, for the total consumption throughout the world, 6,267,000,000 lbs.

It is now nearly a hundred years since Margraff, a Prussian chemist, residing at Berlin, made the discovery, that the beet contained a good crystallizable sugar. His attention was first drawn to this subject by the saccharine taste of the beet, and the crystalline appearance of its flesh, when examined with a microscope. Having cut the beet into thin slices, he dried perfectly, and then pulverized them. To eight ounces of the powder he added twelve of highly rectified spirits of wine, and exposed the mixture to a gentle heat in a sand bath. As soon as the liquid reached the boiling point, he removed it from the fire, and filtered it into a flask, which he corked up, and left to itself. In a few weeks, he perceived that crystals were formed, which exhibited all the physical and chemical properties of the sugar-canes. The alcohol still contained sugar in solution, and a resinous matter, which he disengaged by evaporation. Having submitted several other vegetable substances (as parsnips, skerret, and dried grapes) to the same treatment, he obtained sugar from each. In 1747, he addressed to the academy of Berlin a memoir, entitled, "Chemical Experiments, made with a view to extract genuine Sugar from several plants which grow in these Countries."

Margraff solved the important problem, that genuine sugar was not confined to the cane. After this, he enlarged and varied his experiments, but did not invent means of making sugar from the new material on a scale sufficiently large to render it an object of interest to capitalists. Yet he seems to have had a prescience, that his discovery would one day assume importance. He commended it to the attention of the Prussian cultivators, and particularly the small farmers, as offering a new and beneficial branch of agriculture.

Margraff died in 1782. He was a member of the academy of Berlin, director of the class of natural philosophy, and fellow of the academy of sciences at Paris. His works were collected and published in two volumes, octavo, in French, 1767. A German translation was published at Leipsic, the following year.

It was Achard, also a chemist of Berlin, who discovered the method of extracting the sugar from the beet on a large scale, and at a moderate expense. He first announced this result in 1797. In 1799, a letter from him was inserted in the *Annales de Chimie*, in which he detailed his method. He there states the cost at twopence the pound of Silesia,—or about threepence the pound avoirdupois,—without counting the benefit to be derived from the residuums. He also expressed the opinion, that, with these included, and with some improvements in the processes, this sugar might be produced at half that price. This announcement caused a great sensation in France. It engrossed the attention of the Parisian world; eliciting, alternately, ridicule and admiration. The high price to which sugar had risen in France, in consequence of the capture of nearly all her colonial possessions, gave something more than a speculative and passing interest to the ideas of Achard. The National Institute appointed a commission to examine the subject. The result of their investigation was, that the cost of raw sugar of the beet would be eightpence a pound. The price of sugar was such, that even at that rate a very large profit might have been cleared; but this consideration was not sufficient to induce many persons to take the risk of a peace with England, supposed at that time to be approaching. Only two establishments were formed; one at St Quen, and the other at Chelles, in the environs of Paris. Both of them were failures; partly from the bad quality of their beets, and partly from the ignorance and inexperience of the conductors and workmen. With them went down the high hopes, which had arisen, of this new branch of industry in France.

It is difficult to say, whether these hopes would ever have been resuscitated, if political events of an overruling nature had not supervened. By the Berlin and Milan decrees, all colonial articles were prohibited, and that famous "continental system," so wide and wild in its design, but so important and permanent in its effects, was established. From that time, 1806, chemists and economists applied themselves with renewed zeal to the search after an indigenous source for the supply of sugar. It was thought, at one time, that the desideratum had been attained in the production of grape sugar, or sirup; of which, in the course of two years, many million pounds were made. This sugar, although very abundant in some varieties of the grape, raised in a southern latitude, possesses only two fifths of the sweetening power of the cane and beet sugar. Nevertheless, sugar being at about four shillings a pound, a great number of manufactories were erected, and science and industry were tasked to the utmost, to improve the processes, and to bring it to perfect sugar.

In this state of things, it was announced, that beet-sugar manufactories had been all along carried on successfully in Prussia. It was declared, that from 4 to 6 per cent. of sugar was obtained from the beet, besides several other valuable matters. Other German chemists had instituted experiments and published results substantially the same as Achard's. At length, in 1809—10, experiments were recommenced in France, particularly by M. Deyeux of the Institute, who had reported upon the subject in 1800. The experiments resulted in the production of a considerable quantity of sugar, both clayed and refined, which, as specimens, served to revive and increase the confidence of France in this source of supply. No more than 1 to 2 per cent. was obtained; the beets being of a bad sort, and raised in the neighbourhood of Paris, where a vast deal of ammoniacal manure, hostile to the production of saccharine, is used.

In 1811, M. Drappier, of Lille, worked about fifteen tons of beets, from which he obtained 2½ per cent. of sugar. In the winter of the same year, an experimenter at Paris succeeded in obtaining 4½ per cent. from white beets, raised at a considerable distance from Paris, and without any manure. This was the first essay in France, which approximated to the results of Achard. It was made by M. Charles Durosne, and was detailed in the *Moniteur*. It demonstrated how faulty had been their selection of sorts, and the mode of culture. At this time, Achard had published in German an extensive work, in which he had treated with minuteness every department of the business, from the raising of the seed to the refining of the sugar. This treatise contained not only Achard's experience of thirteen years, but also accounts of the manufacture of beet sugar, on a grand scale, by other persons in Prussia. The result of these enterprises, as reported by a commission appointed by the Prussian government to investigate the subject, was, that in the case presented to their consideration, 60,800 lbs. of sugar were manufactured from 1,000,000 lbs. of beets, which is 6 pounds 1½ oz. per cent., costing for cultivation and manufacture threepence a pound, and selling at eightpence. The profit was stated at 136 per cent., without reckoning 27,883 gallons of vinegar, worth about £450; 155,400 lbs. of feed for beasts, worth £20; and after deducting £310 for the greater supposed expense of refining beet sugar. This, however, has since been recognised as an error; beet sugar being in fact the most profitable to the refiner, by reason of the superior strength of the grain, and of the deterioration which the cane sugar undergoes by fermentation and decomposition during long voyages and storages, before it reaches the pans of the refiners. This loss is estimated, in France, at 14 per cent. on East India sugar, and at 7 on West India. The British custom-house allows one per cent. a month for the waste on bonded sugar.

Such was the result of the operations in the manufactory of the baron de Koppy at Krayn, near Strehlen in Silesia.

In January, 1812, Napoleon issued a decree establishing five chemical schools for teaching the processes of beet sugar making, detailing one hundred students from the schools of medicine, pharmacy, and chemistry, to be instructed in those establishments, and creating four imperial manufactories, capable of making 4,408,000 lbs. of raw sugar annually. Munificent premiums were also decreed to several individuals, who had already distinguished themselves by a successful application to this new branch of industry. A considerable number of manufactories were immediately added to those already existing in France; and, in the season of 1813, a large quantity of sugar, both raw and refined, was produced. A notable improvement was introduced by M. Mathieu de Dombasle, a learned and experienced cultivator and chemist. It consisted in applying to the beet juice the colonial process of depuration, appropriately called in France *défécation*. This was in fact very analogous to the improvement which the Arabs effected in the oriental method. Achard used sulphuric acid in this operation, and for the crystallization broad dishes, not unlike those said to be used in China at this day. The colonial process of *défécation* by lime is now nearly universal in France, as is likewise the substitution of the mould or conical pot, for the crystallizers of Achard.

Such was the prosperous condition of this manufacture, when the disasters of Moscow brought upon it an uncertain political future, that bane of all great industrial enterprises. Confidence and energy gradually yielded to fear and discouragement. A faint and fitful struggle was maintained during another year, until the Cossacks, quartered in the sugar-mills, and the allied artillery, seizing upon the beasts that moved them, gave the manufacturers the *coup de grace*. The officers billeted at their houses became from curiosity their principal customers, being struck with the brilliancy and purity of this unexpected product. After the final overthrow of Napoleon at Waterloo, the price of refined sugar settled down at 6d. a pound, and raw at 3½d. Still, to the surprise of all, two beet-sugar manufactories did survive the shock of this tremendous reverse, more useful to this industry, and to mankind, than all its preceding prosperity; because it demonstrated, what never could have been done under the unnatural stimulus of the "continental system," that there was an intrinsic value in the new industry, rendering it capable of independent existence, and raising it out of the reach of accident, political enmity, or caprice. The establishments which survived were at Arras, in the department of the Pas de Calais, and at Pont à Mousson, near Nancy, in the department of the Meurthe.

After the retirement of the allied troops, in 1818, the government began to turn its attention to the encouragement of an industry, which had struggled meritoriously and successfully to preserve a boon to the French nation. Many eminent and public-spirited citizens raised up establishments, more perhaps to give the benefit of experiments to their countrymen, than with a view to profitable investment. Men of genius and profound research occupied themselves with elaborate experiments, and published their results. Among the most important were the Count Chaptal, who detailed, in Memoirs on the subject, and in his "Agricultural Chemistry," the experience of many years as a cultivator of beets and manufacturer of sugar; and M. Dombasle, who did the same, with admirable clearness and precision, in his work entitled "Facts and Observations relating to the Manufacture of Beet Sugar." As an intelligent and industrious operative, M. Crespel Delisse, of Arras, is worthy of honourable mention. This gentleman was originally a labourer. He became the foreman of the first beet-sugar manufactory at Arras. The proprietor, who had invested an immense capital, sank in the general wreck of 1814—15. M. Crespel succeeded him, with the great advantage of having his fixtures at about one fourth of their real value. This was one of the two establishments which survived.

The method in general use in France is to crush or grind the beet with an instrument called a *rasp*, though its functions would be better described by the word *grater*. It is cylindrical, and revolves four hundred or more times in a minute. This reduces the beets to a very fine pulp. They are then pressed in hydraulic presses of great power, and the juice defecated, evaporated, boiled, and filtered, in very much the same manner as the cane-juice in the colonies. The great difference is, that the beet-sugar machinery has been rapidly improved, and the cane planters have begun to avail themselves of the improvements. There is, however, another method of extracting the saccharine, which dispenses altogether with grating and pressing. This is called *maceration*. It was first proposed by Dombasle, and has been tried in various forms, with more or less success. M. Martin de Roclincourt, originally a captain of engineers, is the inventor of an ingenious and valuable machine for performing this operation. The beet is first cut into ribands, about one line in thickness. They are then plunged in boiling water, which is admitted into the machine at regular intervals, in regular doses. The ribands remain passing through the circuit of the machine during one hour, and steam is occasionally admitted to keep up the heat. In this time, the sugar contained in the ribands is dissolved, and remains in solution in the water, while the ribands, now called pulp, are discharged on the side of the machine opposite to that where they entered it; the liquor containing the saccharine flows off in another direction to the defecating pans.

This method is employed to a considerable extent in France, but by no means so generally as the rasp and press. Its advantages are, that it gives rather more and a rather better product, and requires a great deal less labour. Its disadvantages are, that it takes a great deal more fuel, and does not leave the pulp in so good a taste for feeding; there being too much water in it, and less saccharine, than in that which comes from the press. It might be subjected to pressure, by which a little additional liquor would be obtained for the pans, and the pulp made vastly better for feeding. This, however, would require so much power of the press, and so much pains, that the French generally feed with the pulp just as it falls from the machine. We have little hesitation in giving the preference to this method in a country where fuel is cheap and labour dear. The immense establishment commenced in London in 1837, but abandoned in consequence of the excise of 2½d a pound, which the government hastened to impose in order to guard the West India interest, was upon this system. On the other hand, the only other beet-sugar manufactory, upon a scale of any importance, in Great Britain and Ireland, which is situated near Dublin, has adopted the rasp and press. The former establishment delivered for consumption a considerable quantity of beautiful refined sugar, which was so completely undistinguishable from refined cane sugar, that the government issued an extraordinary notice, that any fraud in the exportation of it with the benefit of drawback would, if detected, be punished with the utmost severity. Whether the establishment in Ireland still exists, we are not informed. It is, however, the opinion of persons skilled in the manufacture and refining of sugar, and who have had small experimental beet-sugar factories near London, that the business cannot be sustained under a duty of 2½d. Others are confident, that, in consequence of the application of the fibre to paper-making, by which the value of the pulp is enhanced fourfold, the business will yet get a permanent footing in Great Britain. We do not think a fair experiment has yet been made in this country.

The great desideratum which the French manufacturers of beet-sugar have always felt, and have been striving to supply, has been at length attained; a method has been discovered by which the beet is deprived of all its saccharine, be the same more or less, and this matter is obtained and operated upon in such a manner as to be nearly all in a crystallizable state. Hitherto, about 50 per cent. of the saccharine has resulted in molasses. This residuum is of comparatively small value; and every thing which arrests the formation of it, adds by so much to the deposit of sugar, and to the profits of the proprietor.

M. Schuzenbach, a chemist of Carlsruhe, in the grand duchy of Baden, is the author of this important improvement. Having obtained his result in the laboratory, he communicated it to distinguished capitalists in Baden, who thereupon formed a company; not with a view, in the first instance, of erecting a manufactory upon the new system, but merely of proving its pretensions. To this end, they advanced a considerable sum for setting up experimental works so large, that the thing could be tried on a manufacturing scale. Having done this at Ettingen, near Carlsruhe, they appointed a scientific and practical commission to follow closely the experiments which M. Schuzenbach should make. Commissioners from the governments of Wurtemberg and Bavaria likewise attended. The experiments were carried on during five or six weeks, in which time several thousand pounds of sugar, of superior grain and purity, were produced.

The Baden company were so well satisfied with the Report of the commission, that they immediately determined to erect an immense establishment, at an expense of £45,000 for fixtures only. A like sum was devoted to the current expenses of the works. Factories were simultaneously erected at or near Munich, Stuttgard, and Berlin. The arrangements were made with remarkable intelligence and caution; and we cannot doubt, that the new method will prove of immense importance to the prosperity, comfort, and improvement of the northern nations and colonies of the Old World and the New.

SWANSEA; a town of South Wales, in the county of Glamorgan, 206 miles W. from London, and 86 W. by N. from Bristol. It is situated on the west bank of the Taw, near the beautiful natural basin called Swansea Bay, which here opens into the British Channel. The tide rolling over and retiring from an extensive beach of level and firm sand, affords great facilities for bathing, which have been duly appreciated both by residents and strangers. The town has only risen into importance within the last thirty or forty years. It is about two miles long, including the suburb of Greenhill, and half a mile broad, and a great proportion of the houses are well built. The chief lodging houses for bathers are at Mount Pleasant and the Burrows. Swansea castle, a portion of which still remains in the middle of the town, was founded by Henry Beaumont, earl of Warwick, who, after the manner of the Norman freebooters, made a predatory war upon the sons of Caradoc ad Jestyn, prince of Gower. After the subjugation of Gower, Beaumont transplanted hither a colony from Somerset, to whom he gave grants of land, and whose descendants still continue distinct from the original inhabitants both in language and manners, and with whom, like the Flemings in Pembrokeshire, they seldom intermarry. The Duke of Beaufort, the present lord of Gower, is proprietor of Swansea Castle. The smelting of copper forms a principal trade at Swansea, and the inexhaustible supply of coal causes ore to be shipped for this place from different parts of Cornwall, Wales, and Ireland. Here are copper-works, iron-foundries, and potteries; ships are built and repaired here, which has occasioned the establishment of roperies, and other consequent trades. Tanneries, breweries, and soap manufactories are conducted upon extensive scales. The surrounding district is replete with mineral wealth. It contains veins of bituminous and stone coal, and culm; limestone is raised in great abundance; besides which, brick and fire-clays, rotten-stone, iron-ore, and other mineral substances appear in large quantities. A number of the population find employment in the coal trade. The coals are conveyed to the town and harbour by means of canals, and a rail-road passes along the shore from the pier to the Mumbles. The harbour of Swansea is one of the most beautiful and secure in the kingdom. On the western pier are a watch-house and lighthouse, with a spacious terrace. Population in 1841, 13,322.

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TALLEYRAND, PRINCE. Charles Maurice de Talleyrand Perigord, was born at Paris in 1754. He was descended from one of the oldest and most illustrious houses of France, which, during the middle ages, were lords of the district of Quercy; and at an early age, as a younger brother, was destined for the church. His ecclesiastical education was formed at the seminary of St Sulpice, and his talents for public business were already so strongly developed, that in 1780 he was named agent-general for the clergy. In 1788 he was consecrated bishop of Autun, and the year after was elected deputy of the clergy of his diocese to the states-general. At that momentous period Mirabeau perceived the extent of his abilities, and signalized him as one of the most powerful and versatile of the men of genius who then abounded in Europe. He proposed several important measures to the States, among others the suppression of tithes and the appropriation of the property of the clergy to the wants of the public treasury. In 1790 he was named president, and in the same year officiated at the altar in the Champ de Mars on the day of the National Federation. He subsequently consecrated the first constitutional bishops, and for this was excommunicated by pope Pius VI. His resignation of the bishopric of Autun, and his election as a member of the directory for the department of Paris, followed soon after. He was left by Mirabeau as one of his executors, and in 1792 was sent into England on a secret mission, together with M. Chauvelin, the ambassador. The English administration under Mr Pitt, after favourably receiving the French envoys, subsequently ordered them to leave the country within twenty-four hours. M. de Talleyrand returned to Paris, the day after the 10th of August, and was indebted to Danton for a narrow escape from assassination. He then left France for the United States, and remained there, engaged, it is said, in commercial speculations, till 1796, when he was recalled by a decree of the Convention. In 1797, after the 18th Fructidor, he was appointed Minister of Foreign Affairs, and supported with the most imperturbable *sang froid* the attacks made against him by all parties. Two years afterwards the 18th Brumaire occurred. Napoleon became First Consul, and M. de Talleyrand continued as foreign minister. In 1802 a brief from Pius VII. released the ex-bishop of Autun from his ecclesiastical ties, and he shortly after married Madame Grandt, of Hamburg. The rivalry of Fouche and M. de Talleyrand then followed, and to the ultimate advantage of the latter, who, on Napoleon becoming emperor in 1806, was elevated to the rank of prince of Benevento, and grand chamberlain of the empire. The next year he was succeeded as minister by M. de Champagny, duke de Cadore, and was named vice-grand elector; but from this period his alienation from Napoleon may be dated; he disapproved of the emperor's aggressions in Spain; and in 1814 was appointed president of the provisional government of France, until the arrival of the Comte d'Artois. He was French commissioner at the congress of Vienna, and on the final return of Louis XVIII. in 1815, he resumed the portfolio of foreign affairs as president of the council, but resigned before the end of the year, from his disapprobation of the tendencies of the government. From this period he remained near the person of the Sovereign in virtue of his title as chamberlain, and ultimately became the leader of the opposition in the chamber of peers. The revolution of 1830 found him, though advanced to a venerable age, not too old for the service of his country, and he proceeded to London as ambassador, where he remained till 1835. After this time the prince has rested under the shadow of his diplomatic laurels, ample enough to include within their branches the treaties of Amiens, of Luneville, and of the quadruple alliance.

The nature and the great gift of Talleyrand was to perceive where power and influence were likely to centre. Even in the turmoil of revolution he was still the courtier, aiming at effecting nothing himself, by either study, or eloquence, or labour, but seeking to fasten on the greatest personal character of the moment, in order through him to wield influence. He first attached himself to Mirabeau, whose executor he became. His secret mission to England, under Chauvelin, followed. But the times became far too menacing and troubled for such spirits as Talleyrand, possessed of more finesse than force, to live or prosper in; and he wisely turned his back upon Europe until the combat of brute force should have terminated, and the stage be left once more open to those qualities and powers which he possessed. He returned to France under the directory. The utter instability of an executive without talent, honesty, or honour, soon induced him to look out for one of those master spirits under the shadow of whose success he might hold more durable and honourable influence. He chose Napoleon, and contributed by his councils to the revolution of the 18th Brumaire. From that period M. de Talleyrand was foreign minister of France, during seven or eight of the most important years that ever occupied diplomacy. He was the obedient, the approving minister of the emperor, until the latter had reached the utmost height that arms and policy could bestow. Talleyrand then would have had him rest, telling the emperor that the ascent was over, that he had reached the mountain top of his fame and power, and that further progress must be descent. The restless spirit of Napoleon disliked and spurned the advice. Talleyrand was overthrown, and the first difficulty which the emperor experienced immediately after from the resistance of Spain was pronounced by his ex-minister to be the *commencement of the end.*

At a moment when the military fame of the empire gave way, all eyes turned to M. de Talleyrand in his retreat. His eminence proceeded from his standing almost alone as a French statesman, Bonaparte having extinguished the class and the race. Could Napoleon, indeed, have trusted him, regained his confidence, and so far yielded his imperial will as to enter into his views, France might have concluded other treaties than those of 1814 and 1815. But Talleyrand soon flung himself into the other scale, and was, more than any other person, influential in bringing about the restoration. Except, however, in the negociations which followed immediately the triumph of the allied powers, the prince was able to recover no permanent position or authority.

From time to time, indeed, he made his influence felt, and showed himself in that prominent light which he was ambitious to appear in. But every one perceived, and he perceived himself, that he was unfit to be the minister of a constitutional government, for which he wanted alike the habits, the character, and the peculiar talents. Considerable obloquy fell on the French government after the three days of July for appointing him ambassador to London. For, whatever might be the purity of his conduct and intentions, prince Talleyrand was considered as the representative of that school of duplicity and selfishness which admits all means to be allowable, provided they obtain their object.

It is remarked in the *Constitutionnel* that "M. de Talleyrand was as eminent for firmness of character as for a comprehensive mind. His powerful influence having been exercised in varying situations, and over destinies the most opposed to each other, and he was naturally charged with having been as changeable as the events of his time. Nevertheless, in the apparently fluctuating character of his existence, one prevailing sentiment may be remarked—an unalterable attachment to the revolution of 1789, and a deep feeling of nationality, for few men have felt so strong an interest in their country's greatness. On the important occasions on which he was employed, his constant study was to derive some advantage for France from the difficult situations which were not his own work, and no man was more capable of turning them to better account. His rare firmness of character, and his imperturbable *sang froid*, enabled him to assume over others at least some portion of the empire which he exercised over himself. It was impossible to exert more influence over an assembly of diplomatists than that for which Talleyrand was indebted to his superior mind, his infinite resources, and the elegance of his language. To give an idea of the effect produced by his style, which after him will probably find no efficient imitator, we may compare his conversation to the prose of Voltaire. He frequently gave way to a natural *nonchalance*, and on such occasions spoke but little; but when he at length shook off this mental indolence, his conversation was enchanting. His habitual chit-chat tone was one of graceful levity that skimmed lightly over the surface of every subject, but which, when serious business was the theme, gave way to an extraordinary depth and force of reasoning. It has been often imagined that he lived, as it were, only intellectually, and that his heart found no room for the feelings of affection; but those who were admitted to his intimacy know that his kindness was unequalled, and that its expression not unfrequently penetrated even through the immovable features which disconcerted so many able negociators."

Talleyrand died after a few days' illness, at Paris, on the 17th May, 1838, and received a public funeral. During his illness, he was visited by the king of the French, and other distinguished personages. His brother, the duke Archambault de Talleyrand Perigord, and the father of the duke de Dino, died on the 28th of April, in the year 1838, at St Germaine, aged seventy-six.

By the will of Talleyrand, he prohibits his heirs from publishing his Memoirs before the lapse of thirty years, and declares that he dies in the Roman Catholic faith. Prince Talleyrand was invested with most of the principal orders of Europe. He was a Knight of the Holy Ghost, Grand Cross of the Legion of Honour from its first creation in 1805, a Knight of the Golden Fleece, Grand Cross of the Orders of St Stephen of Hungary, the Elephant of Denmark, Charles III. of Spain, the Soteer of Greece, the Sun of Persia, the Conception of Portugal, the Black Eagle of Prussia, St Andrew of Russia, the crown of Saxony, and St Joseph of Tuscany. It has been remarked as singular that, notwithstanding he took an active part in the formation of the constitutional government of Belgium, he had not received the Order of Leopold. He was a member of the Académie des Inscriptions et Belles Lettres, and the Académie des Sciences Morales et Politiques.

TANNING, (*a.*) The bark used for tanning is the bark of the oak, though many other substances contain the tannin principle. The outside roughness of the bark, which is called the crut, is first taken off with a large drawing-knife; and after the crut (which is not employed in tanning) is removed, the bark is dried in a kiln and ground in a mill; the bark thus ground is then mixed with water in the pits, and forms what are called the woozes. The term *hide* is applied to the skins of horses, oxen, and cows, which are intended for sole leather and other substantial purposes, and the term *skin* is limited to the skins of calves, seals, and other animals, from which a thinner and more flexible leather is made. When hides are brought to the tanner, the stoutest parts of them are selected to make butts or backs, which are for the sole-leather of very thick shoes. Ox and cow-hides are called crop-hides, and are also used for sole-leather. The first process used towards the skins of horses, oxen, &c. is to soak them in water for a few hours to get out the blood, and they are then put into pits containing lime and water, where they remain ten days or a fortnight, being taken out and in two or three times a-week: after that they are taken out and put across a beam, which is a piece of wood rather convex on the upper side, about three feet broad, and four and a half in length, one end of which rests on the ground, the other end being supported on legs at a convenient height for the workman, who spreads the hide on it, and takes the hair off with a blunt kind of drawing-knife, called a working knife, which is curved to suit the form of the beam; this being completed, the hides are "fleshed," that is, the fat, &c. is all removed from the inside of the hide with a double-edged drawing-knife, called a flesher. The hides are then put into a weak wooze, and frequently handled, *i.e.*, drawn in and out of the pit to prevent creases, and that they may thoroughly imbibe the tanning principle: from this weak wooze they are removed gradually to woozes stronger and stronger. The same woozes are used for many hides in succession. The pits in which the woozes are contained are usually about seven or eight feet long by four broad. From six to eight months in all are sufficient to complete the tanning of the commonest kind of sole-leather, called *crop* by the trade. After being taken from the pits, crop-hides are hung up to dry, in an airy shed or loft, and when fully dried, after a very slight dressing with a sort of scraper, are fit for the market, and for their purpose. They are of a brownish-white appearance, wrinkled in the grain and a little rough on the other or flesh side, and are generally (at the thickest) between a quarter and half an inch in thickness. From the combination of the tanning with the gelatin of the hides, they are rendered strong, yet flexible, and unputrifiable.

When it is wished to make cow-hides into a stronger kind of leather, called *bend*, the tanning process is carried on for a longer period. As bend is the strongest of sole-leather, the thickest and best cow-hides are selected for the purpose of making it; and nearly a year's immersion, in various ways, in the tan liquors, is necessary for its manufacture. The cow-hides applied to this purpose, after being tanned for that time, are not simply dried for the market like crop, but are beaten, when they are dried, into a firm consistence, so that a piece of bend looks like a polished pebble on being cut. The instrument with which bend is beaten is a broad brass hammer. From being so long in the tan-pits, the colour of bend is a deep brown.

Such is the manner of procedure, when it is wished to convert cow-hides into the two principal forms of leather used for the soles of shoes. Cow-hides also form the upper or black leather of strong and coarse shoes. The weakest and smallest species of cow-hides are generally appropriated to this purpose. After being removed from the lime-pits, and denuded of the hair, they are placed in pits filled with a solution of the ordure of pigeons, which has the effect of removing all vestiges of the lime. They are then placed upon a board, called a beam, and "shaven (as it is called) in the bait." That is, the inner or flesh side is shaven with a sharp knife, and considerable slices or portions taken from it, until the operator thinks it reduced to the proper thickness. This process is necessary, as it is obvious that the same degree of thickness will not suit both upper and sole-leather. After getting this primary shaving, the hides are put into the tan-pits, and undergo a steeping, which occupies a little shorter time than that required for crop hides. When the operation, at the end of some six months or so, is over, the cow-hides destined for upper leather undergo a degree of drying, after which they are handed over to the currier, who has to convert them into upper leather. They are given by the tanner to him in a thickish, rough, and somewhat hard state, and of a brown colour, and he has to convert them into the soft, easily flexible, smooth, neat, and black-hued article which they appear when used in shoes.

The currier's first process is to steep them, and then to shave them further with the very peculiar knife which he uses. This is a double-edged knife, with a horizontal handle at each end. The edges of this knife are not straight, but curved, and, therefore, in cutting, the knife is held nearly at right angles to the hide, which is thrown over an upright beam, something resembling an erect tombstone of small size. The workman stands behind the beam, and, holding the knife with both hands, shaves the surface of the hide downwards. The currier's whole task is to shave down the leather, to soften it properly, and to blacken it. He accomplishes the thinning or shaving of it in the way mentioned. The softening is effected by rubbing in grease into it with hard brushes upon a large broad table. In order to let the grease enter the leather properly, the hides are hung up in a greased state to dry. When they are taken down, great care is exerted to take out the superfluous grease by scraping, &c., as the cleanness of the leather would be otherwise destroyed, nor would it blacken well. The last shaving is given after this period, to bring it to the required thickness. The hides are now firm, yet flexible, neat, and clean. The chemical action that takes place between tanning and iron is brought into play finally to black the hides, which is done on the flesh or outer side. The grain side is left always unbroken from first to last. These blackened cow-hides, then, are now fit for making shoes, of the strongest kind, such as are worn by tradesmen who work at coarse work. The name given to these dressed cow-hides is *neat's leather*, from the word neat, which is applied to cattle sometimes.

A considerable quantity of the shoes made for the middle classes of society are formed neither of neat's leather nor calf, but of the hides of cattle between the cow and calf in age. This kind of leather is called *kip*, and is between the two others in quality, being neither so clean and fine as the calf, nor so coarse and strong as the neat hide.

Horse-hides are extremely little used for the manufacture of leather, in comparison with cow and calf-hides, and in truth, the hides of horses cannot be procured in such numbers. But if they could, they would still be less used, for the hide of the horse is comparatively very weak. The hair is limed off, as already described, and the tanning gone through much in the same way as with cow-hides, much less time, however, being required. When the currier gets the tanned horse-hides into his hands, and has shaved them to the proper extent, and softened them with grease, he blackens the grain, and not the flesh side, as in the previous instances. When the currier has finished them, they are called *cordovan* hides, from having been first dressed in this way in the famous city of Cordova. Long ago, a great quantity of light shoes were made of cordovan, but this kind of leather is much less used in this way now-a-days, calf being preferred for all purposes. The coloured kind of leather, generally known by the name of Morocco, is composed of the dressed skins of young goats or kids.

Calf-skins, and the skins of other animals intended for dressing-leather, are first put into a pit of water to get out the blood, and they are then placed in the lime-water to remove the hair, after which they are steeped in a solution of the excrement of pigeons, in pits called "grainers," to render them soft and to cleanse them from the lime. They remain in these a day or two, and are worked over with a working-knife of the same kind as that used to remove the hair, the object of this being to remove all the small hairs and the filth called the "scud," which is the technical term for the colouring matter of the hair, that of red calves being red; of black ones, black, and the like. When the skins are sufficiently soft and clean they are immersed in the woozes, where they remain three months, more or less, according to the judgment of the manufacturer. Skins are more slowly and carefully dried than hides; and they are pulled out by hand as they dry, to prevent their shrinking, and, when nearly dry, they are doubled up and beaten upon a pin-block by a man holding the skin in his hand and striking it against the pins. The pin-block is four feet in length and two in width. The pins, which are of wood, are four inches in height and an inch in diameter; they are fixed upright on the block, and are placed in rows of eight by eighteen, being 144 in all. The leathers are sorted and put into half dozens, so as to make the weight of each bundle nearly equal. They are sold to the currier, who dresses and blacks them for the upper-leather of shoes and boots, and many other purposes.

Previously to the year 1830 there was an excise duty on leather, but that duty was taken off by an act of parliament passed on the 29th of May in that year. Leather imported into this kingdom is, by a statute 3rd and 4th year of William IVth. (c. 56), made liable to a duty of 30 per cent. on the value, except in certain cases, which are otherwise specified; and skins which are not dressed are made liable to a duty of 20 per cent. on the value, except the species enumerated in the statue, which are — for a tiger-skin, 2s 6d.; a lynx-skin, 6d.; chinchilla-skin, 3d.; elk-skin, 1s.; &c.

TAVISTOCK; a town or England, in the county of Devon, situated on the river Tavy, 206 miles W. S. W. from London, and 33 S. W. from Exeter. It dates its origin from the erection of an abbey of black monks, commenced by Orger, Earl of Devonshire, 961, and completed by his son Ordulph, in 981: it was burnt to the ground by the Danes, but was soon after rebuilt and considerably enlarged, and the establishment became more flourishing. From Henry I. it received the jurisdiction of the entire hundred of Tavistock, and the privilege of a weekly market and fair; and Richard Barham, the thirty-fifth abbot, procured from Henry VIII. the right of sitting in the House of Peers, which continued till 1539, when John Peryn, the last abbot, surrendered it to the king. The possessions of the abbey, with the borough and town of Tavistock, were then given to John, lord Russel, ancestor of the present noble proprietor, the duke of Bedford. Various fragments of this venerable structure still remain, but are mostly incorporated with other buildings; these consist of the gatehouse and several complete buildings near it: the refectory is now used as an assembly-room, the boundary-walls may still be traced, and near the canal bridge is an entire gateway. The monastery is remarkable for having contained an institution for the study of Saxon literature at a very early period, and also an ancient printing-press. Here are also some remains of Old Morwell house, formerly the hunting-seat of the abbots of Tavistock.

The manufactures of Tavistock consist chiefly of coarse woollens, but many of the inhabitants are employed in the neighbouring mines, which produce copper, lead, tin, and manganese. A large iron-foundry and tin-smelting establishment are in the town. The Tavy works the machinery of some mills. The Tavistock canal, opened in 1817, forms a junction with the Tamer about five miles distant. This borough has sent two members to parliament ever since the reign of Edward I. Population in 1841, 7697.

TAYLOR, Thomas, usually called the Platonist, was born in London, in the year 1758. At an early age he was sent to St Paul's school, where he acquired the rudiments of classical learning. The elements of science were then, as now, absurdly excluded from the routine of education; but following the bent of his mind to speculative pursuits, he acquired, by private study, a sound knowledge of the theories of arithmetic, algebra, and geometry. He was next placed under the care of the Rev. Mr Worthington, of Salters' Hall Meetinghouse, to be qualified for the office of a Dissenting minister; but troubles arising from an early marriage, disgusting him with his tutor and his vocation, he became an assistant at a boarding school, and for many years endured patiently the pressure of incessant toil and narrow circumstances. The love of mysticism and metaphysical subtility, by which he was ever distinguished, was first displayed in an essay on "A new Method for Reasoning in Geometry." The metaphysical view of mathematics which he adopted, led him to the study of the old Greek philosophers. He began with Aristotle, and proceeded to Flato, whose sublime speculations at once rivetted his affections. While engaged in the study of the academic philosophy, he accidentally met with the works of Plotinus, and read them, as he himself informs us, "with an insatiable avidity and the most rapturous delight, notwithstanding the obscurity of that author's diction, and the profundity of his conceptions." He next studied the commentaries of Proclus, and read them through thrice—a task, it is thought, never performed by any other man. The generous patronage of Messrs W. and G. Meredith enabled him to publish the "Orphic Hymns," and some other Platonic fragments. He next translated "Plotinus on the Beautiful," a work of singular obscurity; and Proclus's "Commentary on Euclid," in which there is much ingenious mathematical research, mingled with the wildest speculations of the Alexandrian school. These were followed by translations of the Platonic Sallust; of the Pythagoric Sentences; some Hymns of Proclus; two Orations of the Emperor Julian; and five books of Plotinus, with very copious notes and illustrations. The mere titles of these translations will suggest, what a closer examination of them would prove, that Mr Taylor was not so much a Platonist as a Neo-Platonician; that he followed less the pure doctrines of the academy, than their extension by the school of Alexandria and the Sophists. The compound of all eastern and western metaphysics preached by the later Platonicians, patronised by the emperor Julian, and advocated by the Sophists, as a rival to Christianity, is really the Platonic system developed by Mr Taylor. His admiration of these writers was unbounded; and his enthusiasm was not at all abated by finding himself alone in his worship. The most laborious of Mr Taylor's tasks was a translation of Pausanias, in three volumes, for which he received only sixty pounds! It must, however, be said, that his notes illustrate neither the topography nor the history of this valuable description of ancient Greece, but are devoted to mystical speculations on the recondite meaning of ancient fables, the doctrine of ideas, &c., which are as much out of place as if they had been appended to Paterson's Book of Roads. His greatest works, complete translations of Plato and Aristotle, are copiously illustrated from the ancient commentators, and will be found a rich storehouse of information for those who desire to study the beautiful philosophy of ancient Greece. The publication of these works was also due to the liberality of the Messrs Meredith.

Through the exertions of his friends, Mr Taylor was appointed assistant secretary to the society of arts; his salary, and an annuity of £100 per annum, generously settled upon him by his friend Mr W. Meredith, secured him a competence suited to his limited desires. He died at his house, Walworth, on the 1st Nov. 1835. His conversation is said to have abounded in speculation, and to have been earnestly sought by those who love to wander through the magnificent mazes of metaphysics.

TELFORD, Thomas, a highly distinguished civil engineer, was born in the year 1757, in the pastoral valley of Eskdale, a district in the county of Dumfries. His parents occupied a station in the humble walks of life, which, however, they filled with becoming respectability. His education was limited, both in duration and extent. The parochial school of Westerkirk was his only seminary, and here nothing beyond the simple elements of learning was to be acquired. At the age of fourteen, he was bound apprentice to an eminent builder, in the county that gave him birth; and, having obtained a competent knowledge of his business, on the expiration of his term he for some years practised the same profession in his native district. The southern counties of Scotland, however, at that time furnished but little encouragement for talent; and, as a natural consequence, industry found but a scanty reward. Convinced of these facts, he resolved to leave his native abode, and, accordingly, he repaired to Edinburgh, where he continued, with unremitting application, to study the principles of architecture, agreeably to the rule of science. Here he remained until the year 1782, when, having made a considerable proficiency, he left the Scottish for the British metropolis, and came to London under the patronage of the late Sir William Pulteney (originally Johnstone) and the family of Pasley, who were natives of the parish of Westerkirk.

The first public employment in which he was engaged was that of superintending some works belonging to government in Portsmouth dock-yard. The duties of this undertaking were discharged with so much fidelity and care as to give complete satisfaction to the commissioners, and to insure the future exercise of his talents and services. Hence, in 1787, he was appointed surveyor of the public works in the rich and extensive county of Salop; and this situation he retained to his death.

In 1790 he was employed by the British Fishery society to inspect the harbours at their several stations, and to devise a plan for an extensive establishment at Wick in the county of Caithness. This work was satisfactorily accomplished, and it has been the chief centre of the herring fishery on that coast, under the name of Pulteney Town.

During the same year, 1790, an extensive inland navigation, in length about one hundred miles, called the Ellesmere canal, was confided to his general management. This, in its track along the base of the Welsh hills, passes over the aqueducts of Pont y Cysylte and Chirk. The former, one thousand feet long, and one hundred and twenty-eight feet high, and the latter, six hundred feet long, and seventy feet high, were constructed according to his plans, and under his direction.

In the years 1803 and 1804 the parliamentary commissioners for making roads and building bridges in the Highlands of Scotland, and also for making the Caledonian canal, appointed Mr Telford their engineer. Under the former board, eleven hundred bridges, two of one hundred and fifty feet span, were built, and eight hundred and sixty miles of new road were made; and under the latter board the Caledonian canal, of unusually large dimensions, was constructed.

Under the road commissioners, on the Glasgow, Carlisle, and Lanarkshire roads, thirty bridges, one of one hundred and fifty feet span, and another one hundred and twenty-two feet high, were constructed. Under the same commissioners, and local trustees, above thirty harbours were built; some of which, as at Aberdeen and Dundee, are upon an extensive scale. At and adjoining to Edinburgh, two very lofty and expensive bridges were built from his design, and under his direction. He was also occasionally employed by the city of Glasgow.

Nor were his labours and talents exclusively devoted to Scotland and Wales. In England his professional employment became very extensive. Five large bridges over the Severn were executed after his plans. One of these was one hundred and thirty, another one hundred and fifty, and a third one hundred and seventy, feet span. In all the works to which the commissioners for the loan of exchequer bills granted aid, he acted as their engineer, which, in the aggregate, amounted to more than twenty instances. By the general post office he was also employed in making many extensive surveys in sundry districts of England, Scotland, and Wales.

As engineer to the parliamentary commissioners for improving the communication between London and Dublin, all the works on the Holyhead road, including the Menai and Conway bridges, were performed under Mr Telford's direction, with the exception of the landing-piers of Holyhead and Howth, for those he only completed.

While the preceding works were being executed, several other branches of inland navigation were carried on under his direction. Among these may be named the Birmingham and Liverpool, and the Macclesfield canals; the unrivalled improvements upon the old Birmingham, and the extension of the Ellesmere and Chester canals. A new tunnel also, 3000 yards in length, under the Harecastle hill, on the summit of the Trent and Mersey canal, was conducted under his superintendence, as was likewise the improvement of the river Weaver navigation, which is the outlet of the Cheshire salt works.

In the metropolis, the St Catherine's docks, at Tower hill, were constructed under Mr Telford's direction; and in the Fens, the new outfall of the river Nene, and the drainage of the North Level, stand as memorials of his scientific skill, industry, and perseverance.

In the year 1808 he was employed by the Swedish government to survey the ground, and lay out an inland navigation, through the central parts of that kingdom. The design of this undertaking was to connect the great fresh water lakes, and to form a direct communication by water between the North Sea and the Baltic.

In 1813 he again visited Sweden, taking with him some experienced British workmen, with such suitable materials as were wanted. Here he inspected the work in its progressive state, and superintended such branches as required practical observation. This gigantic undertaking has been fully accomplished, notwithstanding the numerous obstacles it became necessary to surmount. The communication between the lakes has been in active operation for several years; and the whole works being completed, the entire intercourse between the Baltic and the North Sea was to be opened in October, 1834.

The honorary distinction of fellow was awarded to Mr Telford by the royal societies of London and Edinburgh. In 1818 an institution of civil engineers was established, which, being found of practical utility, was incorporated by royal charter in 1828. This institution consists of above two hundred members, resident not only in the British isles, but in Russia, Germany, France, Holland, and India. Of this institution, from its commencement, Mr Telford was annually elected president, a tribute of respect to his transcendent talents cheerfully paid by its numerous members.

We have already adverted to some of Mr Telford's undertakings. The following is a more detailed list of the principal works executed by him, and under his direction:—

1788. Shrewsbury Castle converted into a dwelling house.

New gaol built for the county of Salop.

Twenty-six bridges in the same county, from 20 to 130 feet span; two of these over the river Severn.

1798. A bridge over the river Severn, at the town of Bewdley, consisting of three arches.

A bridge, 112 feet span, over the river Dee, at Kirkcudbright, in Scotland.

Bridgenorth Church.

The Ellesmere Canal, commenced in 1790. Length, 103 miles.

Highland roads and bridges commenced in 1803. Under this commission were built 1117 bridges in the Highlands. Of the roads, that from Inverness to the county of Sutherland, and through Caithness, is superior in point of line and smoothness to any part of the road of equal continuous length between London and Inverness. This is a remarkable fact, which, from the great difficulties Mr Telford had to overcome in passing through a rugged, hilly, and mountainous district, incontrovertibly establishes his extraordinary skill in the engineering department, as well as in the construction of great public communications.

The Caledonian Canal, begun in 1804. Locks, each 180 feet long, 40 wide, depth of water, 20 feet. One of Mr Telford's most splendid works; in constructing every part of which he surmounted prodigious difficulties.

Dunkeld Bridge, finished in 1809. Nine arches, centre one 90 feet span.

The Glasgow, Paisley, and Ardrossan Canal.

Aberdeen Harbour. Extension and improvements commenced in 1810.

Dundee Harbour. Extension and improvements, commenced in 1815.

Dundee Ferry Piers on both sides of the river, in 1822.

The Glasgow and Carlisle Road, commenced in 1816, upon which were built 23 bridges of 150, 90, 80, 60, 50 feet span and under.

The Lanarkshire Roads, including bridge at Cartland Craigs, 123 feet high; and four other large bridges.

Increasing the width of the roadway over Glasgow old bridge with cast-iron.

The Dean Bridge over Leith Water, at Edinburgh, four arches, each 90 feet span. Roadway above the river 108 feet.

Pathhead Bridge, 11 miles from Edinburgh, on the Dalkeith road, five arches, 70 feet high.

Morpeth Bridge, Northumberland, consisting of three arches.

The Holyhead Road from London to Dublin, including the Menai and Conway Bridges. It has been said, and no doubt truly, that Mr Telford was inclined to set a higher value on the success which attended his exertions for improving the great communication from London to Holyhead, the alterations of the line of road, its smoothness, and the excellence of the bridges, than on that of any other work he executed. The Menai Bridge will unquestionably be the most imperishable monument of Mr Telford's fame. This bridge over the Bangor Ferry, connecting the counties of Carnarvon and Anglesea, partly of stone and partly of iron, on the suspension principle, consists of seven stone arches, exceeding in magnitude every work of the kind in the world. They connect the land with the two main piers, which rise 53 feet above the level of the road, over the top of which the chains are suspended, each chain being 1714 feet from the fastenings in the rock. The first three-masted vessel passed under the bridge in 1826. Her topmasts were nearly as high as a frigate; but they cleared 12 feet and a half below the centre of the roadway. The suspending power of the chains was calculated at 2016 tons; the total weight of each chain, 121 tons. This stupendous undertaking occasioned Mr Telford more intense thought than any other of his works: he told a friend (Dr James Cleland,) that his state of anxiety for a short time previous to the opening of the bridge was so extreme, that he had but little sound sleep; and that a much longer continuance of that condition of mind must have undermined his health. Not that he had any reason to doubt the strength and stability of every part of the structure, for he had employed all the precautions that he could imagine useful, as suggested by his own experience and consideration, or by the zeal and talents of his very able and faithful assistants, yet the bare possibility that some weak point might have escaped his and their vigilance in a work so new, kept the whole structure constantly passing in review before his mind's eye, to examine if he could discover a point that did not contribute its share to the perfection of the whole. In this, as in all his great works, he employed, as sub-engineers, men capable of appreciating and acting on his ideas; but he was no rigid stickler for his own plans, for he most readily acquiesced in the suggestions of his assistants when reasonable, and thus identified them with the success of the work. In ascertaining the strength of the materials for the Menai bridge, he employed men of the highest rank for scientific character and attainments.

Improving the river Weever navigation, between the Cheshire salt works and sea entrance.

Constructing a tunnel 3000 yards in length, through Harecastle hill, upon the Trent and Mersey navigation, near the great Staffordshire potteries.

Making a canal from ditto, 29 miles in length, by Macclesfield, to the Peak forest and Huddersfield canals.

Improving the Birmingham old canal, formerly laid out by Mr Brindley.

Making a canal 39 miles in length, with a branch 11 miles, to connect the Birmingham canal with the Shropshire and Cheshire canals, and open a new communication with Liverpool and Manchester, and thence to London.

Improving the outfalls of the river Ouse, in Norfolk, and the Nene in Lincolnshire, including the drainage of the North Bedford Level, between the Nene and the Welland.

Constructing the St Katherine docks, adjoining Tower hill, London.

Constructing a cast-iron bridge, 170 feet span, over the river Severn, at Tewksbury, in Gloucestershire.

Building a stone bridge, 150 feet, over the Severn, near the city of Gloucester.

Designing a stone bridge of seven arches 50 feet wide within the parapets, and 500 feet long, built over the Clyde, at Glasgow, on the site of Jamaica street bridge, and called Glasgow bridge.

Opening a navigable communication across Sweden, from Gothenburg, on the North sea, to Soderking, on the Baltic.

In the year 1817, parliamentary-loan commissioners were appointed to apply £1,750,000 towards carrying on public works. Mr Telford was employed as their engineer; and from that time he examined and reported on the following works, for which aid was requested:—

1. The Regent's canal, from Paddington, by Islington, to Limehouse.
2. A cast-iron bridge across the Thames from Queen Street.
3. A short canal between the Thames and Isis, and the Wilts and Berks canal.
4. For an extension of Folkstone harbour, on the coast of Kent.
5. For completing the Thames and Medway canal from Gravesend to Rochester.
6. For completing the Gloucester and Berkley canal, which was done under his direction.
7. For completing the Portsmouth and Arundel canal.
8. For the Tay Ferry piers, which were constructed under his direction.
9. For rebuilding Folly bridge, at Oxford, on the site of Friar Bacon's Study.
10. For making a short canal between the river Lea and the Regent's canal.
11. For rebuilding Windsor and Kingston bridges upon the river Thames.
12. For making a canal from the city of Exeter to the sea.
13. For constructing a harbour at Shoreham, on the coast of Sussex.
14. For building a timber bridge at Teignmouth, in the county of Devon.
15. For completing the Bridgewater and Taunton canal.
16. For constructing locks and wears upon the river Thames.
17. For completing the Liverpool and Manchester Railway.
18. For completing Courton harbour in Ireland.
19. On the proposed Railway between Waterford and Limerick.
20. On the Ulster canal, as proposed, in the north of Ireland.
21. On the Norwich and Lowestoft navigation previous to the commencement, and while in progress

Mr Telford also made the following extensive surveys, by direction of the post office:—

1. From London, by Ware and Royston, and also by Barnet and Hatfield, to Newark on the Trent.
2. From thence, by York and Newcastle, to Morpeth, also by Doncaster, Boroughbridge, and Durham, to the same place.
3. From Morpeth by Alnwick, Berwick, and Haddington to Edinburgh; also by Wooller, Coldstream, and Dalkeith, to Edinburgh.
4. From Boroughbridge, by Hexham, to Caterfell, on the Teviot Ridge; also, from the same place, by Aldstone Moor down the South Tyne, and across the Irthing river, to Castleton in Liddesdale.
5. From Carlisle, by Langholm, top of Ettrick and Farquhair, to Edinburgh.
6. From Glasgow, across Ayrshire, and along the coast to Stranraer and Portpatrick.
7. From the Holyhead road, at Dunchurch, by Tamworth and Lichfield, to Newcastle, Staffordshire, and thence in three several directions to Liverpool.
8. From Northleach, in Gloucestershire, by Monmouth, Brecon, Carmarthen, and Haverfordwest, to Milford Haven; also from Bristol, by Newport and Cardiff, along the shore to Pembroke.

Many details of Mr Telford's works are contained in Sir Henry Parnell's "Treatise on Roads."

The genius of this distinguished engineer was not confined to his profession. At an early period of his life he gave indications of considerable poetical talent. He was the "Eskdale Tam" of the poetical corner of "The Scot's Magazine," and addressed a poetical epistle to Robert Burns, a portion of which is given in Dr Currie's Life. But, as has been justly and finely observed, "Mr Telford was a poet of the highest order all his lifetime: not a mere rhyme-stringer, into which almost any dunce might be drilled: the poetry of his mind was too mighty and lofty to dwell in words and metaphors; it displayed itself by laying the sublime and the beautiful under contribution to the useful, for the service of man. His Caledonial canal, his Highland roads, his London and Holyhead road, are poems of the most exalted character, divided into numerous cantos, of which the Menai bridge is a most magnificent one. What grand ideas can words raise in the mind to compare with a glance at that stupendous production of human imagination?"

Mr Telford had taught himself Latin, French, and German; and could read those languages with facility, and converse freely in French. He understood algebra well, but thought that it led too much to abstraction, and too little to practice. Mathematical investigation he also held rather cheaply; and always, when practicable, resorted to experiment to determine the relative value of any plans on which it was his business to decide. He delighted in employing the vast in nature to contribute to the accommodation of man. When the project of Denocrates, to hew Mount Athos into a statue of Alexander, bearing a city in the one hand and an aqueduct in the other, was one day mentioned in his presence, his eyes glistened with pleasure, and he exclaimed that Denocrates "was a magnificent fellow!" Nature and practice had so formed his eye for judging of levels, that he has been often known to ride through a country and point out the line which a canal must take, and subsequent surveys have confirmed his views. He was the patron of merit in others, wherever it was to be found: his kind disposition, unaffected manners, and easiness of access, were the means of raising many deserving individuals from obscurity to situations where their talents were seen and appreciated. He was a man of sound principle; and his gradual rise from the stone-masons' and builders' yards to the top of his profession, in his own country, or, we believe we may say, in the world, is to be ascribed not more to his genius, his consummate ability, and his persevering industry, than to his plain, honest, straightforward dealing, and the integrity and candour which marked his character throughout life. He was never married. His servants always spoke of him as the kindest of masters. He died at his house in Abingdon street, Westminster, on the 2d of September, 1834. His remains were deposited in Westminster abbey on the 10th of the same month.

TENTERDEN, Lord. See *Abbot, Charles*, in Supplement.

TERTIARY FORMATIONS. In geology

all the deposits above the chalk have obtained this name, as being of subsequent and distinct formation. Along with the remains of extinct animals, they also contain those of existing species, and are supposed to be of various ages, and consequently of various periods of deposition. The London clay, and Paris basin are ranked as the oldest, and here the remains of mammalia are abundant. Besides being found in various parts of Europe, tertiary deposits have also been discovered in Asia and America. See *Paris Basin*.

THETFORD; an ancient borough of England, situated partly in Norfolk and partly in Suffolk, eighty miles N.N.E. from London. It takes its name from the river Thet, which here joins the Lesser Ouse; the latter passing through the town separates the two counties, and is navigable to Lynn. The town is connected with the houses on the Suffolk side of the river by a handsome iron bridge, erected in 1829. The inhabitants derive their chief employment from an extensive paper-mill, a large iron-foundry, an agricultural machine manufactory, several breweries, and malting establishments; a good trade is also carried on in corn, wool, and other articles.

In the reign of Edward III. Thetford contained twenty-four principal streets, five market-places, twenty churches, eight monasteries, and six hospitals, besides other religious and charitable foundations; but of these, only the names of some remain, and of others a few dilapidated walls serve to mark the sites. Thomas Martin, F.A.S. author of a history of Thetford, was born here in 1696; and Thomas Paine, author of the Rights of Man, was also a native of this town, and educated at the free-school. Population in 1841, 4040.

THIRSK; a town in the north riding of Yorkshire, 217 miles N.N.W. from London. It is divided into two parts, called Old and New Thirsk, by the small river Codbeck, which is crossed by two substantial stone bridges. New Thirsk, with a commodious market-place in the centre, occupies the site of a strong and extensive castle, erected about 979, by the ancient family of Mowbray; in the reign of Henry II., Roger de Mowbray, having become a confederate of the king of Scotland, here erected his standard against his lawful sovereign. On the suppression of that revolt, this fortress, with many others, was entirely demolished by order of the king; the moat and ramparts are still visible, but no vestige of the building remains. Old Thirsk stands on the north-east side of the river, and consists of a long range of cottages on each side of the road. The inhabitants are chiefly employed in the manufacture of coarse linens and sacking. Population in 1841; of borough and town, 3020; of parish, 4599.

THUGS, (*a.*) In the body of the work, we adverted to a fraternity in India, called Thugs or Phansigars, who are united by religious or superstitious rites, and who mainly subsist by strangling and plundering travellers. Although this extraordinary sect of miscreants has long existed, it is only within these few years that any satisfactory knowledge regarding them has been obtained. An article in the Edinburgh Review for Jan. 1837, was the first to draw public attention towards them in this country, and from that article we shall take the liberty of extracting a summary of their history.

The Thugs travel along the roads under various assumed characters, in parties varying from ten or twelve to several hundreds. They appear as traders, as pilgrims, as sepoys seeking or returning from service; and sometimes one of their number figures as a Raja, with all the necessary equipments of tents, carriage, &c., and the rest act the part of his obsequious followers. If the gang is numerous, they are divided into separate parties, who follow each other at some distance, or, taking different routes, rendezvous at an appointed place in advance. Their victims are almost always travellers. The most expert members of the gang are employed to collect information, and insinuate themselves into the confidence of the travellers whom they find at the resting places, or overtake on the road. They usually propose to them to join company for mutual safety; and if the traveller suspects one party, he soon falls in with another, who pretend to enter into his feelings of distrust. A person is sent before to select a proper place for the murder, and scouts are employed to prevent intrusion. The travellers are generally induced to sit down under pretence of resting themselves, and they are strangled at once on a given signal. The bodies are then buried, after having been mangled to expedite dissolution, and to prevent their swelling and causing cracks in the ground. Two Thugs are employed in the murder of each individual, one of whom holds his legs or hands, while the other applies the noose. If a traveller have a dog, it is also killed, lest the faithful animal should cause the discovery of the body of its murdered master.

In Bengal, which is much intersected by rivers, the plan is modified to suit the circumstances of the country. The practice there is to inveigle travellers on board pretended passage-boats, which are manned entirely by Thugs, and then to strangle them and throw the bodies into the river. Several of these boats follow each other at short intervals, so that if the traveller escapes one snare, he may fall into another.

The Thugs are forbidden by their rules to kill women of any description, and either men or women of the following classes—fukeers, bards, musicians by profession, dancing men or women, washerwomen, sweepers, oil-venders, blacksmiths, and carpenters, when found together, maimed or leprous persons, men with cows, and Ganges water-carriers, while they have the Ganges water actually with them; but if their pots are empty they are not exempted. These exceptions, however, are not made, as has been supposed, out of compassion, but from a feeling which we shall explain hereafter, and which is the strangest part of this strange system. The Thugs date all their misfortunes from their murder of a native lady, whom they call the Kalee Beebee, or black lady, who was proceeding to Hyderabad with a sheet of cloth of gold, for the tomb of a brother of Sulabut Khan. Since that, the northern Thugs have murdered women as well as men; but those south of the Nerbudda adhere to their primitive usage in this respect.

The extent to which the natural feelings of humanity have been extinguished in these miscreants, is perfectly astonishing. A party of them accompanied Newal Singh, a Jemadar in the Nizam's service, and his family, more than two hundred miles,—were on the most intimate terms with them for about twenty days,—and received essential favours from them. Once Newal Singh, not knowing them to be Thugs, procured their release, when they were imprisoned on a charge of setting a house on fire, in which they had lodged; and on another occasion his two daughters, of eleven and thirteen years of age, saved them from detection by sitting upon some plundered silk, whilst they were searched by the police. The whole gang hesitated; and one party separated from the main body rather than be present at the murder. But will it be believed what was the cause of their demur? Not any dislike to sacrifice people to whom they owed so much, and with whom they had consorted on such friendly terms – that never entered into their minds—but the circumstance of Newal Singh having but one arm. He and all his family were put to death.

The Thugs also occasionally preserve young children of both sexes, and adopt them as their own; and sometimes young women of a riper age are saved, to become the wives of the murderers of their parents.

As the existence of Thuggee has been discovered at different times and in different parts of India, efforts have been made for its suppression. Mr Wright, magistrate of Chittoor, formerly made great exertions for this purpose in the south, and Messrs Halhed and Stockwell in the north of India. A very interesting paper was even published by Dr Sherwood of the Madras establishment, in the thirteenth volume of the *Asiatic Researches* on the subject, of which we have made occasional use. The full extent of the evil, however, was not then known; and whilst our active magistrates flattered themselves that they had put a stop to the practice, it was really only temporarily suspended in their own neighbourhood. A system which embraced the whole of India could not be suppressed by a few partial inroads upon it. The dispersion of the gangs had the usual effect of a persecution which does not go the length of entire eradication. The scattered Thugs formed numerous separate gangs; and, although the number of raw recruits whom they enlisted contributed in the end to their downfal, yet its immediate effect was greatly to increase the number of victims.

At last, the disclosures which were made on the occasion of the apprehension of a large gang of Thugs by Major Borthwick, in Malwa, in 1831, attracted lord William Bentinck's attention; and a system was organised by him for the general suppression of this monstrous evil. Jubbulpoor was fixed as the centre of operations. Captain Sleeman was appointed superintendent, with a number of European assistants, and the co-operation of the native states was engaged. The plan of proceeding is founded on an accumulation of evidence given by Thug approvers. Two or three of the members of every gang which is seized, are admitted as king's evidence, and they are immediately called on to dictate a narrative of all the expeditions in which they have ever served,—mentioning the individuals with whom they were associated; and their authentic testimony is then considered as closed. The trials depend upon the concurrence of a number of depositions, the originals of which were taken in different parts of India, from different persons, without a possibility of previous intercommunication;—upon the recognition of the prisoner by the witnesses, to each of whom he is shown in a crowd of other people;—and upon the confirmation of the evidence by the discovery of the bodies in the places indicated. Each of the assistants has a section of India allotted to him, within which he is responsible for the apprehension of these miscreants, with the help of the approvers and of the accumulated evidence; and as the mass of information is rapidly becoming more and more complete, we may hope that every professional Thug in India will soon be known and secured. Up to October 1835, 1562 persons had been committed on the charge of Thuggee; of whom 382 had been hanged, and 986 transported or imprisoned for life. In the sessions of 1836 held at Jubulpoor, 241 prisoners were convicted of the murder of 474 individuals, of whose corpses 314 were disinterred, and inquests held upon them.

In 1834 these operations were threatened with a severe check, which was happily averted by lord William Bentinck's firmness. Maun Singh, the Rajah of Joudpoor, pleaded the right of granting asylum, and refused to give up the Thugs who had taken refuge in his territory; but he was informed that he could not be permitted to make his country the headquarters, whence these bands of assassins might carry on their attacks against all the neighbouring states. On his persisting, an army was assembled against him, and he quietly submitted. The power which put down the Pindaree system was alone equal to the suppression of Thuggee. Occasions like these afford the best illustrations of the advantages of our supremacy in India. Even if the requisite public spirit and intelligence were not wanting, the native states are incapable, from mutual jealousy and distrust, of combining together for the accomplishment of any object of general interest. At this point, the supreme power steps in;—explains to subordinate allies the extent of the evil, and the nature of the remedies which ought to be applied;—collects for one common effort the resources of the whole of India, and directs that effort by European intelligence, energy, and perseverance.

Notwithstanding the alleged antiquity of the profession, the Thugs to the north of the Nerbudda cannot trace their own pedigree higher than the era of the first race of Mahommedan kings of Dehli. Their tradition is, that their ancestors, who were then divided into seven clans, as their descendants still are, used to infest the roads in the neighbourhood of the capital, until they drew upon themselves the anger of an emperor of the house of Ghoree, by murdering one of his domestics, who was in league with them, and who threatened to betray them with a view to extort more money than they thought reasonable. On this, they were expelled from Dehli. The majority of them retired to Agra; and ultimately to the strong country at the junction of the Jumna, the Chumbul and the Kalee Sindee, which continued to be their headquarters until they were driven away by Mr Halhed in the year 1812. These seven clans are the original trunk upon which all the Thug associations to the north of the Nerbudda have been grafted. They were originally all Mahomedans; but for a long time past Mahomedans and Hindus have been indiscriminately associated in the gangs; the former class, however, still predominating. Their numbers are kept up by descent (the profession being, as is usual in India, hereditary), by adoption, and occasionally, but not often, by the admission of qualified adults.

The Thugs to the south of the Nerbudda boast a purer descent. They can trace back the trade of Thuggee in their families for more generations, and have adhered with greater strictness to the rules of their profession than those who are of Dehli origin. They also refuse to intermarry with the families of the latter,—saying, they are of lower caste, and formerly 'drove bullocks and were itinerant tradesmen.' This point was warmly disputed by the northern and southern Thugs before Captain Sleeman. It was admitted by some of the northern men that, at their funerals, the women who bring the water, chant the occupations of the ancestors of the deceased, in a manner which shows that they were originally descended from gangs of wandering Mussulmans, who followed armies, and lived in the suburbs of cities and in the wild wastes, and that their pretensions to higher descent were unfounded. Others acknowledged, that at marriages an old matron will sometimes repeat as she throws down the toolsee—[*] 'Here's to the spirits of those who once led bears and monkeys; to those who drove bullocks, and marked with the godnee;[†] and those who made baskets for the head;' but others, who were more zealous for the honour of their tribe, insisted that these were only disguises assumed by their ancestors to enable them to practise their trade in greater safety.

It is admitted on all hands, that two of the original seven clans of northern Thugs, which did not, like the others, settle at Agra after their expulsion from Dehli, retain their wandering habits to this day; and there seems reason to suspect, that most of the gipsy tribes who are to be found in all parts of India, but are most numerous to the north and west, practise Thuggee as occasion offers.

The account which the Thugs give of the first establishment of their profession will explain the nature of its pretensions to a divine origin.

'The Thugs have a tradition that a demon, by name Rukut Beej Dana, infested the world, and devoured mankind as often as they were born or created; and to enable the world to be peopled, Kalee Davey determined to put him to death. This demon, they say, was so tall that the deepest ocean never reached above his waist; and he could, consequently, walk over the world at his ease. Kalee Davey attacked him, and cut him down; but from every drop of his blood another demon arose, and as she cut them down, from every drop of their blood another demon sprung up, and the numbers increased at this geometrical rate, until she became fatigued with the labour. On this she formed two men from the sweat brushed off from one of her arms; and giving them each a handkerchief, told them to put all these demons to death, without allowing one drop of their blood to fall on the ground. After their labour was over, they offered to return to the goddess the handkerchiefs with which they had done their work; but she desired them to keep them as the instruments of a trade by which their posterity were to earn their subsistence, and to strangle men with these handkerchiefs, as they had strangled the demons, and live by the plunder they acquired; and having been the means of enabling the world to get provided with men by the destruction of the demons, their posterity would be entitled to take a few for their own use.'

The goddess also told them that they might leave the bodies of their victims on the ground, and she would take care that they should be removed, provided they never looked back to see how she disposed of them. On one occasion, however, a slave had the audacity to look back, and saw the goddess without any clothes on, devouring the bodies and throwing them about in the air. Her modesty and dignity were naturally offended, and she told them, that in future, they must bury the bodies themselves; but from some remains of compassion for her ancient followers, she bestowed on them a pick-axe endowed with various supernatural qualities.

A pick-axe is consecrated by each gang before setting out on an expedition, and is regarded by a Thug much in the same light as his sword is by a soldier. It is the mark of his profession;—he swears by it, and under such an awful sanction, that the person who forswears himself will, within two or three days, 'die a horrid death; his head will turn round, his face towards his back, and he will writhe in tortures till he dies.' The sound of the consecrated pick-axe is never heard in digging a grave by any except a Thug. It is carried by the shrewedest, cleanest, and most sober and careful man of the party in his waist-belt. While in camp, he buries it in a secure place with its point in the direction they intend to go; and if another direction is better, its point will be found changed. Formerly it used to be thrown into a well, whence it would come up of itself, when summoned with the appropriate ceremonies; but since the northern Thugs have begun to do what is forbidden, and neglected what is enjoined, it has lost that virtue, as far as they are concerned. In the Deccan, where the primitive spirit of Thuggee has not been departed from, this is still the case. 'During a whole expedition that I made with them,' says a northern Thug, who served a campaign with the people of his own profession, in the south, 'Imam Khan and his brother carried the pick-axe, and I heard them repeatedly in the morning call them from the well into which they had thrown them overnight, and saw the pick-axes come of themselves from the well, and fall into their aprons, which they held open *thus*—Here he described the mode.'

The most ordinary and effectual mode, however, in which the goddess interferes in behalf of her votaries, is by means of omens. These are considered by the Thugs as signs expressly appointed to guide them to their prey, or to warn them of approaching danger; and no member of the fraternity doubts, that if these omens had been attended to and the other prescribed rules observed, the system of Thuggee must have flourished under the auspices of its divine patroness, in spite of all our efforts for its suppression.

TIN, (*a.*) The principal tin-mines of Cornwall are in the south-west part of the county, in the parish of St Just, where the country consists principally of granite; but there are several productive mines in the slate in other places. Some tin-mines are worked under the bed of the sea. One was opened actually in the sea some years ago. It was called Wherry Mine, and was situated near the shore, a little to the west of Penzance, where a rock of elvan, which had been found to contain slender veins of ore, was uncovered at low water. An adventurous miner set to work, although the rock was covered several feet deep at every tide, so that he could only proceed during a part of the day. Every time the men returned to their work they had to empty out the water in the excavation they had formed; but after they had advanced some way an inclosure, or kind of coffer-dam, like what is used in building the piers of bridges, was constructed, which rose above the high-water level, and, by machinery connected with a steam-engine at 200 yards distance on the shore, the work was proceeded with. The mine produced a considerable quantity of ore for several years, when unfortunately a large vessel, which had drifted from her moorings, struck against the coffer-dam, overturned it, and the whole works were in an instant filled with water.

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[*] Ocymum sanctum. Tulsee was a nymph beloved by Krishna, and by him turned into this plant.

[†] Needle used in tattooing.

There are two systems of tin veins in Cornwall, both running nearly east and west; but the oldest dip to the north, while the newer, which traverse the former, dip to the south. Their width is various, from a few lines to several feet, and in their length there is the same diversity: some have been traced as much as two miles. The same vein is continually changing its dimensions in point of width. Those which are found in the slate are usually much more productive of metal than those which traverse the granite; and they very commonly are met with at the junction of these two descriptions of rocks, and usually pass from the one into the other without any change taking place in the nature and contents of the vein, although there are not unfrequent exceptions to this. Quartz is the most common substance of the vein, and the ore is disseminated through it; but the vein-stone often consists of other minerals. In most of the veins of Cornwall, tin is found nearer the surface than copper. Besides the veins now found traversing the rocks, another abundant supply of tin in Cornwall is from what are called the "*stream works.*" In the lower parts of many valleys there are accumulations of gravel, sand, and other alluvium, and in these vast quantities of rolled pebbles and sand, composed of a very pure tin-ore, are met with. That ore is dug up and such mines are called "stream-works," because streams of water are employed to wash the gravel and sand, and so separate the ore from the other substances with which it is mixed. One of the most extensive of these is that called "Happy Union," in the valley of Pentuan and parish of St Austell, where, for many ages, a vast quantity of tin has been obtained. The valley is from 300 to 600 feet wide, and contains an accumulation of gravel, sand, and clay, to the depth of 60 feet, in many places. The gravel consists of fragments of granite, similar to that of the adjoining hills, all considerably rounded by attrition, together with fragments of slate, which have not been much water-worn. The tin-ore lies, for the most part, in the lowest bed of this alluvial deposit, and in the form of coarse sand, and of pebbles of all sizes, up to ten lbs. weight.

Until the latter part of the seventeenth century, all the tin produced in Cornwall, whether from streams or mines, was smelted in blast furnaces with charcoal. It was not until the former part of that century that pit-coal had been successfully applied to the smelting of any of the metals. The decrease of wood in Cornwall, and the consequent increasing expense of smelting tin with charcoal, naturally induced the tinners to turn to any substitute, and to try the use of pit coal. This was probably the immediate cause of the erection of air (reverberatory) furnaces, in which the fuel and the ore were separated, and culm-coal (possessing much of the properties of charcoal) mixed as a flux with the ore.

There are now three kinds of tin made in Cornwall, viz., grain-tin, refined tin, and common tin.

Grain-tin was formerly made solely in blast-furnaces, only from the diluvial tin-ores, or what is generally called stream-tin, remarkable for its superior purity. It was the only kind of tin used for making tin plates (or rather for tinning the plates of iron), on account partly of its fluidity, and partly of its superior colour and lustre. It was also used, in small quantities, in dyeing scarlet and in making tinfoil. The price was much higher than that of common tin, sometimes 20s. to 30s. per cwt. higher. Grain-tin has lately been almost wholly made in reverberatory furnaces, like other tin, but still generally from diluvial ores, although mixed, in a small degree, with the very purest mine ores. This cheaper mode of manufacture has greatly reduced the price.

About the beginning of the present century when scarcely enough grain-tin could be procured for the use of the tin-plate manufacturers, the tin-smelters, by selecting particular ores, commenced making tin of such a quality as was quite fluid enough for tin plates, although not of so fine a colour; which was used for the first coat on the iron plate, and grain-tin for the second (for all the plates are dipped twice in the tin). This is called refined tin, and its quality has been so much improved, (although still it is not equal to grain-tin,) that by most of the tin-plate manufacturers no other tin is now used. There are a few, however, who still use grain-tin for the outer coat of the plate.

Common tin is made from the mass of the tin-ores of Cornwall.

Statement of the quantities of grain-tin and other tin made in the twenty years ending with 1837.

	Grain tin.	Refined and Common tin.
Years.	Tons.	Tons.
1818	660	3,406
1819	325	2,990
1820	306	2,684
1821	394	2,979
1822	377	2 941
1823	423	3,790
1824	494	4,511
1825	321	4,037
1826	265	4,338
1827	311	5 244
1828	314	4,617
1829	246	4,168
1830	315	4,129
1831	240	4,060
1832	236	4,087
1833	216	3,849
1834	244	3,745
1835	267	3,961
1836	296	3,758
1837	299	4,531
	6,569	77,805
Average about 1-13th part	325	3,890

The relative prices of the different kinds of tin are now:—

	s.	
Superior grain for dyeing, &c.	99	per cwt.
Tin-plate grain . . .	94	
Refined ditto . . .	89	
Common ditto . . .	82	

The name grain-tin appears to have been given to it from its quality of granulating. This is done by placing a block of it in a furnace-kettle, and heating it as high as it will bear without melting; it is then raised by a pulley to a considerable height, and suddenly dropped on a hard surface, by which it becomes instantly divided into small straited masses, to which the name *grains* has been given.

As contradistinguished from this, the other tin was formerly called *block-tin*, but this distinction has long been disused.

The quantity of grain-tin now consumed in dyeing, and in making tinfoil, is nearly if not quite, 200 tons per annum.

The prices of tin in the home market, for the twenty years ending with 1837, were as follows:—

Price of Tin in the Home Market in each Year from 1818 *to* 1837.

Years.	Common tin in London. s.	d.	Refined tin in Wales. s.	d.	Years	Common tin in London. s.	d.	Refined tin in Wales. s.	d.
1818	84	9	88	6	1828	73	3	81	9
1819	75	3	78	6	1829	71	0	80	8
1820	73	3	76	9	1830	73	9	78	0
1821	75	8	81	0	1831	73	6	83	0
1822	79	6	100	9	1832	72	9	78	0
1823	94	9	105	3	1833	72	9	78	9
1824	88	0	93	3	1834	78	0	68	6
1825	91	4	94	6	1835	91	6	99	0
1826	77	0	82	3	1836	100	6	114	3
1827	76	0	83	3	1837	88	0	93	8

The price of tin-plate grain-tin is usually about 5s. per cwt. above the price of refined tin.

Until 1838 all the tin of Cornwall paid a duty of 4s. per 120 lbs. to the duke of Cornwall, or to the sovereign when there was no duke: the fees to the officers, and the loss of time, were equal to 1s. more. This duty is now however abolished, and the miners reap the benefit.

The only part of Europe besides Great Britain in which tin is now obtained in any quantity is Germany. There are mines in Bohemia, Saxony, and Silesia, and the produce is sufficient to supply a large proportion of the demand for this metal in that part of Europe. There are some mines of high antiquity in Spain, in Gallicia, but we have no information respecting their present state. It was not known to exist in any part of France till the year 1809, when it was discovered not far from Limoges, in the department of Haute Vienne; and, in the year 1817, it was accidentally found in the south of Brittany, not far from the mouth of the river Loire. A marine officer, who had long been detained as a prisoner of war in England, and had been quartered in Cornwall in the neighbourhood of the tin-mines, returned to his native town of Piriac, a small sea-port of the department of the Lower Loire. Going out sea-fishing one day, and wanting some weights for his lines, he picked up a pebble on the shore, which appearing to him unusually heavy, he took it home to compare with a piece of Cornish stream tin which he had brought from the place of his captivity, and found it to be the same substance. He gave notice of his discovery in the proper quarter, and M. Dufrenoy, now a distinguished French geologist, then a young *aspirant* of the school of mines, was sent with another to investigate the matter, and the report they made shows a remarkable uniformity of structure between that part of Brittany and the tin district of Cornwall on the opposite side of the channel. The country between the mouth of the Loire and Piriac is composed of granite and slate, and it is at the junction of these rocks that the tin ore is chiefly found. They met with veins traversing the rocks, and a considerable quantity of stream tin both in the form of pebbles and of sand; and their impression was, that this stream tin was produced by the wearing of the rocks containing the veins by the action of the waves; the same action going on now, as in Cornwall in remote ages. The continued large importations of tin from England into France shows that this discovery has not as yet been attended with any great results.

By far the largest quantity of tin that has yet been found in any part of the world is, after Cornwall, in the Indian Archipelago. It has been met with as well on the continent as in the islands, from about 8° north to 5° south latitude, and from 98° to 107° of east longitude. It is found in Siam, and in numerous parts of the Malayan peninsula, and in the islets on its coast, and in the island of Borneo; but the richest mines are in the island of Banca, which lies off the south-eastern part of Sumatra. The discovery was accidental, in the year 1710, when some stream tin was smelted in a fire that had been made on the ground. The ore is wholly of this description, and occurs, as in Cornwall, in alluvial deposits; it is seldom followed below thirty or forty feet deep, and the beds of ore frequently lie within three or four feet of the surface. The mines are exclusively worked by Chinese under the authority of the government, and they deliver the metal at a fixed rate. The smelting is conducted by a very simple and rude process, and yields from 50 to 70 per cent. of pure metal; where it yields less than 30 per cent. it is not thought worth working. In thirty years after the discovery the mines yielded no less than 3870 tons, and in the most prosperous times they are said to have produced about 3500 tons annually, but latterly not more than half that quantity. The mines are in the northern and western parts of the island, but a large portion of it yet remains to be explored, and in the opinion of Sir Stamford Raffles, there seems no reason to apprehend any deficiency in the ore for centuries. Mr Crawford thinks that the falling off is more to be ascribed to a want of skill in the art of mining than to any deficiency of the ore. The higher mountains of Banca are of granite, and the stream tin is found in gravel composed of granite and other primary rocks. Sir S. Raffles is of opinion that the tin ore found in the Malayan peninsula and islands, including that of Banca, has been originally washed down from the great central mountains of the continent which terminate the eastern peninsula. The principal demand for Banca and Malay tin is in China, which is probably not less than 1000 tons in the year, and Bengal takes off about half than quantity, the remainder going to America and Europe.

TOD, Lieutenant-colonel James, of the hon. East India Company's service, was a native of Scotland, and born about the year 1782. In March, 1800, at the age of seventeen or eighteen, he left England for India, and obtained a commission in the second Bengal European regiment. Thence he volunteered for the Molucca isles, was transferred to the marines, served as one on board the Mornington, and afterwards, as he expressed it, "ran the gauntlet from Calcutta to Hurdwar." In December, 1805, when a subaltern in the subsidiary force at Gwalior, he was attached to the embassy of his friend, Mr Græme Mercer, sent at the close of the Mahratta war to the camp of Sindhia, then seated amongst the ruins of Mewar, which it reached in the spring of 1806. This interesting country (Rajpootana) became the scene of his future official labours; and it has fallen to the lot of very few individuals to perform services so important, considered with reference to the scope of his duties. His disposition was eminently frank and open, warm and sensitive, yet distinguished by all those qualities which make up our idea of amiability. His character was firm, independent, and energetic, bordering on enthusiasm. A strong taste for geographical, historical, and archæological pursuits, was developed by the accident which placed him in a country rich in those objects and recollections which gratify the antiquary,—a country, as he states, at his visit almost a *terra incognita* to Europeans, and peopled by a race whose rudimental qualities, though obscured by the vices engendered through misgovernment, were in harmony with those of his own character. Almost immediately upon his arrival in that country (as he tells us in his Geographical Memoir) he began its survey, the details of which he has stated in the Memoir, and the result is given in the magnificent map which graces his *annals* of Rajast'han. In the maps prior to this survey, Rajpootana was almost a total blank; nearly all the western and central states are wanting; the rivers were supposed to have a southerly course into the Nerbudda, and the position of the two capitals (the ancient and the modern) of Mewar was precisely reversed; Cheetore being placed in the best maps S. E. of Oodipore, instead of E.N.E. The map of colonel Tod was completed in 1815, and presented to the marquis of Hastings: it is worth remarking that the author first bestowed the name of Central India upon the country, which it has since retained. The map was of vast utility to the government, being made one of the foundations of lord Hastings' plan of operations in the year 1817. His surveys were continued without interruption, except by his indefatigable researches into the history and antiquities of the Rajpoot states, till 1817, when he was appointed political agent of government, having the sole control over the five principal states of Rajast'han; Mewar, Marwar, Jessulmér, Kotah, and Boondi.

The results of his administration, as restorer of Rajpootana, are exhibited in his great work, and are traced in still more unexceptionable characters, in the gratitude of the people. The extraordinary and enthusiastic attachment of the Mewarees, in particular, to him, are painted in very delightful colours by bishop Heber, who, during his journey through this part of India, heard incessant inquiries respecting "Tod Sahib," and whether it was likely that they should see him again. "His name," the bishop observes, "appears to be held in a degree of affection and respect by all the upper and middling classes of society highly honourable to him." Speaking of Bheelwara, which colonel Tod had almost re-created, he says,—"In short, as one of the merchants who called on me said, 'It ought to be called *Todgunge;* but there is no need, for we shall never forget him.' Such praise as this," he continues, "from people who had no further hopes of seeing or receiving any benefit from him, is indeed of sterling value." The fact is, that the place was called *Todgunge*, but this name was withdrawn at the instance of colonel Tod himself.

In the year 1822, after two-and-twenty years of service, eighteen of them spent amongst the Rajpoots of western India, and five as political agent, colonel Tod's shattered health called upon him imperatively to suspend his toils and quit the climate of India. But the ruling passion forbade him to proceed direct to the port of embarkation. In 1819, he had completed the circuit of Marwar, visiting its capital, Joudpoor *viâ* Komulmér, thence returning by Mairta and Ajmer to Oodipoor. Next year, he visited Kotah and Boondi, the latter of which he revisited in 1821, having received intelligence of the death of his friend, the Rao Raja, Ram Sing, who had left colonel Tod guardian of his infant son, the prince of the Haras. He returned to Oodipoor in March, 1822, and took final leave of the valley in June of that year. He proceeded across the Aravulli to Mount Aboo, and inspected the wonders of that sacred place. He discovered the ruins of an ancient city in the skirts of Marwar; explored the ancient city of Anhulwarra, the capital of the Balhara sovereigns; crossed the peninsula of Saurashtra to its extreme western point, visiting in his way Puttun Somnath and its celebrated temple, and the Jain shrines of Girnar; and embarked for England, at Bombay, in the early part of 1823. From the period of his return, his time, fortune, and health were devoted to literary pursuits. Indeed, to his ardent and unremitting exertions, whenever he was not actually disabled by suffering, must be ascribed the fatal attack which terminated his existence in the vigour of life. He was seized with apoplexy on the morning of Monday, the 16th of November, the anniversary of his marriage, while transacting business at his bankers', and expired in the afternoon of Tuesday, the 17th of November, 1835. He had latterly passed twelve months abroad, in the hope of conquering a complaint in the chest, and returned to England only on the 3d of September. During his last winter, in Rome, he was daily occupied on a work, to be entitled "Travels in Western India," being the result of observations in a journey he made to the peninsula of Guzerat just before he finally quitted the country.

TRIM; an ancient town of Ireland, the capital of the county of East Meath, in the province of Leinster; is situated in the parish of the same name, which is partly in the barony of Lower Moyfenragh, and partly in that of Upper Navan. It lies to the north-west of Dublin, from which it is distant thirty-two miles. It is built upon the banks of the river Boyne, and is surrounded by a productive and populous district. It formerly returned two members to the Irish parliament. The trade carried on here is very trifling; a few persons are employed in the manufacture of ticken and woollen for home consumption. Trim is remarkable for its ancient ruins; among them the castle is the most prominent, both from its dimensions, and its situation on the banks of the Boyne. It is said, indeed, to be the most spacious edifice of the kind, of which there are any remains in Ireland. Besides the castle, there are the ruins of several monastic establishments in the town and neighbourhood. Population of parish of Trim, 5926, of which 3282 are in the town.

TROTTER, Thomas, M.D. formerly physician to the channel fleet; was a native of Roxburghshire, and was educated at the university of Edinburgh with a view to the medical profession. In 1782, when very young, he was appointed surgeon in the royal navy; and in his treatise on the scurvy (first published in 1786) he says that he was the first member of his corps who was obliged to seek employment in the African trade. On his return from Africa in 1785, he settled at a small town in Northumberland; and, during his residence there, he obtained, in 1788, his doctor's degree at Edinburgh, the subject of his thesis being De Ebrietate, which was praised by Dr Cullen. In 1789, by the friendship of admiral Roddam, he was appointed surgeon of his flag ship. In the same year he was examined before a committee of the House of Commons appointed to inquire into the slave-trade. In 1790, he published a "Review of the Medical Department of the British Navy;" in 1793, he was appointed physician to the royal hospital at

Portsmouth, and in the next year physician to the fleet. Before this period, the medical discipline of the navy had been in a miserable state, both as respected the care of the men's health, and the advancement of the medical officers. Dr Trotter, however, presently arranged these matters in a systematic manner; and the many marks of respect which were shown him, both by officers and by seamen, are the best proofs of the advantageous nature of the changes which he effected.* On his retirement from the navy, Dr Trotter settled at Newcastle, where he practised for many years with great reputation, occasionally amusing himself with poetry and other elegant literary pursuits. He died on the 5th Sept. 1832. His professional works deservedly rank high, and their authority is frequently quoted by medical professors and teachers. The titles of his publications not already mentioned, are, in chronological order, as follows:—Medical and Chemical Essays, 1796. Medica Nautica, or an Essay on the Diseases of Seamen, 1799, 3 vols. 8vo. Suspiria Oceania, a Monody on the late Earl Howe. An English edition of his Essay on Drunkenness, 1804. 4th edition 1812. An Address to the Proprietors and Managers of Coal Mines, on the Means of destroying Damp, 1806. A View of the Nervous Temperament, being a practical Treatise on Nervous, Bilious, Stomach, and Liver Complaints, 1812, 8vo. The Noble Foundling, a Tragedy, 1813. A volume of Poems; also many communications to the Medical Journal, the European Magazine and other periodical works.

TROUGHTON, Edward, an eminent mathematical and astronomical instrument maker, was a native of Cumberland. At the age of seventeen he came to London, and was instructed by an elder brother in the rudiments of the art in which he afterwards so greatly excelled. About the year 1780, in conjunction with his brother, he settled in Fleet street, and at that early period of his life laid the foundation of his future fame. His invention of a method by which the graduation of instruments of the largest class could be effected with a degree of ease and accuracy unattainable by any former means, and the construction of an engine (still in the establishment of his successor) for the division of those of smaller dimensions, added to the skill and care employed in their arrangement and execution, gave to his works a superiority that was early appreciated by those whose pursuits required such assistance. His method of original graduation was disclosed to the public through the medium of the royal society, in the year 1809; and the Copley medal was awarded to him by that learned body, of which he was shortly afterwards elected a fellow. Of the astronomical society he was an original member, subsequently one of the vice-presidents; and to the close of his life felt a lively interest in its prosperity. His celebrity was not confined to his native country, for about the year 1830 the gold medal of science was presented to him by its illustrious patron the king of Denmark. To what extent the present state of navigation, geography, and astronomy is indebted to his talents, is not easily determined; but there was scarcely any extensive geodætical operation undertaken in which his assistance was not solicited; and there is scarcely an observatory in the world of any notoriety that does not contain some monument of his genius, either executed in the establishment of which he was once the head, or constructed by other artists in imitation of his models. He died on the 12th June, 1835, aged eighty-one.

TROWBRIDGE; a town of England, in the county of Wilts, situated on an eminence near the river Were, a little above its junction with the Avon, ninety-nine miles W. by S. from London. The inhabitants are employed in the manufacture of woollen cloth, which was introduced here at an early period; the articles made are chiefly kerseymeres, with some superfine broad cloth. A communication is opened with London and Bristol, by means of the Kennet and Avon canal, which passes about a mile north of the town.

The church, which is dedicated to St James, is a spacious structure, consisting of a nave, chancel, two side aisles, with chapels attached, a north and south porch, and a large tower at the west end, surmounted by a lofty spire; the nave and aisles are crowned with battlements and crocketed pinnacles. Here are also places of worship for Baptists, Presbyterians, and Methodists. A free-school in which fifty boys are instructed, is supported by property left for charitable purposes. The Rev. George Crabbe, the poet, was rector of this parish for eighteen years, and died here Feb. 3, 1832. Population of town and parish in 1841, 11,050

TYPE-FOUNDING. In the article *Printing*, in the body of the work, an account is given of the invention of movable metal types, and their application to the art of printing. In this place, we have only to describe the manner in which types are made. The metal of which they are formed is an alloy, consisting essentially of four-fifths lead and one fifth regulus of antimony, or three parts lead to one of antimony. The smallest sized types requiring the hardest metal, the alloy for these i twenty-five parts of the regulus of antimony to seventy-five parts of lead: the proportions are varied for the larger sizes, so that in some only fifteen parts of antimony are used to eighty-five of lead. The antimony gives the lead a superior hardness when cast; and as this alloy has the property of shrinking less than most other metals as it cools, the type receives all the sharpness and finish, which it can acquire, by filling every part of the mould. In making types, the letter is first cut by an artist upon the end of a steel punch, answering to the shape of the intended type, or the letter may be formed by hammering down the hollows, filing up the edges, and then hardening the soft steel. The punch is then driven into a piece of copper, which forms the *matrix*, or bottom of the mould intended to produce the letter. As many varieties of punches must be made of steel as there are sizes and species of characters required. In casting, the types are formed with great rapidity, owing to the quickness with which the metal cools. The mould in which the types are cast, is composed of two parts. The outer part is made of wood, the inner of steel. At the top it has a hopper-mouth, into which the fused type-metal is poured. The interior cavity is quite uniform, although the mould consists of two divisions, because each half, which forms two of the four sides of the letter, is exactly fitted to the other. The matrix is placed at the bottom of the mould, directly under the centre of the orifice, and is held in its position by a spring. Every letter that is cast can be loosened from the matrix only by removing the pressure on the spring.

The furnaces of a type foundry are each surmounted with an iron pot containing the melted alloy. Into this pot the founder dips a very small iron ladle, to lift merely as much metal as will cast a single letter at a time. Having poured in the metal with his right hand, and returned the ladle to the melting pot, the founder throws up his left hand, which holds the mould, above his head, with a sudden jerk, supporting it with his right hand. It is this movement which forces the metal into all the interstices of the matrix; for without it, the metal, especially in the smaller moulds, would not be able to expel the air and reach the bottom. The pouring in the metal, the throwing up the mould, the unclosing it, removing the pressure of the spring, picking out the cast letter, closing the mould again, and re-applying the spring to be ready for a new operation, are all performed with such astonishing rapidity and precision, that a skilful workman will turn out 500 good letters in an hour, being at the rate of one every eighth part of a minute. A considerable piece of metal remains attached to the end of the type as it quits the mould. There are nicks upon the lower edge of the types, to enable the compositor to place them upright, without looking at them.

From the table of the *caster*, the heap of types turned out of its mould, is transferred from time to time to another table, by a boy, whose business it is to break off the superfluous metal, and this he does so rapidly as to clear from 2000 to 5000 types in an hour; a very remarkable dispatch, since he must seize them by their edges, and not by their feeble flat sides. From the breaking off boy, the types are taken to the *rubber*, a man who sits with a grit stone slab on a table before him, and having on the fore and middle finger of his right hand a piece of tarred leather, passes each broad side of the type smartly over the stone, turning it in the movement, and that so dexterously, as to be able to rub 2000 types in an hour.

From the rubber, the types are conveyed to a boy, who, with equal rapidity, sets them up in lines, in a long shallow frame, with their faces uppermost and nicks outwards. This frame, containing a full line, is put into the dresser's hands, who polishes them on each side, and turning them with their faces downwards, cuts a groove or channel in their bottom, to make them stand steadily on end. It is essential that each letter be perfectly symmetrical and square; the least inequality of their length would prevent them from making a fair impression; and were there the least obliquity in their sides, it would be quite impossible, when 200,000 single letters are combined, as in one side of the *Times* newspaper, that they could hold together as they require to do, when wedged up in the chases, as securely as if that side of type form a solid plate of metal. Each letter is finally tied up in lines of convenient length, the proportionate numbers of each variety, small letters, points, large capitals, small capitals, and figures, being selected, when the fount of type is ready for delivery to the printer.

Several mechanical schemes have been proposed for founding types, but as yet none of them can compete in practical utility with the dexterity and precision of handiwork.

An account of the different sizes of types, with specimens, will be found in the article *Printing*.

Schoeffer, the partner of Guttenburg, the reputed inventor of the art of printing with movable types, was the first who invented matrices for *casting* types, each individual type having been before this *cut* in wood or metal. Upon this invention the practical utility of the art of printing mainly rests. In the early history of the art printers were all their own letter-founders and also their own bookbinders; but as business increased, a division of labour took place, and the trades began to be separated. In England, we find it ordered by a decree of the Star Chamber in 1637, that there shall be four founders of letters for the kingdom, and no more. The provisions of this absurd and oppressive decree were recognized in an act of 14th Charles II., (1674,) which again restrained the number of master-founders to four; and, by the same act, the number of printers was limited to twenty. This, however, was only a provisional act, which appears to have been impossible of execution, like all other enactments which are directly opposed to the spirit of an age. The demand for knowledge had become so general that four founders and twenty printers were quite inadequate to the supply, whatever might be the opinion of Charles II. and his arbitrary court. The supply, therefore, went on. In a very curious book, written by Joseph Moxon, a mathematical-instrument maker, who also applied his mechanical knowledge to the art of letter-cutting, we are informed that, in 1686, "the number of founders and printers were grown very many, insomuch that, for the more easy management of typography, the operators had found it necessary to divide it into the several trades of the master-printer, the letter-cutter, the letter-caster, the letter-dresser, the compositor, the corrector, the pressman, the ink-maker, besides several other trades which they take into their assistance, as the smith, the joiner &c." Such a division of labour indicates the natural progress of an art towards perfection, and is indeed in itself a cause of that perfection. Moxon says that letter-cutting was a handy-work at that time, kept so concealed among the artificers of it, that he could not learn any one had taught it any other. Moxon himself, however, laid down mathematical rules for the formation of letters, but he does not appear to have attempted any improvement in their shape. In the reign of Anne most of our type was imported from Holland, where the letter-founders had succeeded in producing much more beautiful characters. At length, however, in 1720, William Caslon, an engraver of gun-locks and barrels, having the credit of being a most ingenious artist, was employed by the "Society for Promoting Christian Knowledge" to cut the punches for a fount of Arabic. His success led him to enter into the business of a letter-founder, in which undertaking he was assisted by Bowyer, the celebrated printer. In a very few years Caslon had rendered the English types superior to any in Europe; when the importation of foreign types ceased, and the founts of this ingenious founder became in demand on the continent.

Among the more distinguished type-founding establishments, that of Wilson and Sons, Glasgow, long stood pre-eminent. The types manufactured there were highly esteemed all over Europe for their elegance and durability. Those in the Greek character, especially, were held to be unrivalled. This establishment was begun about the year 1740, by Dr Alexander Wilson, a very ingenious man, who afterwards became professor of practical astronomy in the university of Glasgow. It was continued by his descendants with undiminished credit till the year 1834, when the business was removed from Glasgow to London, for what good reason we know not. In 1832, a branch from the Glasgow establishment was commenced at Edinburgh, under the firm of Wilson and Sinclair, the management of which was placed in the hands of Mr Duncan Sinclair, who had been for more than twenty years foreman over the Glasgow foundry.

U

ULVERSTONE; a town in Lancashire, situated near the estuary of the rivers Crake and Leven, 22 miles N.W. of Lancaster, and 261 miles from London. The town is of considerable antiquity, and is said to have been called by the Saxons *Ulpha's town*. It consists principally of four spacious streets, the houses forming which are generally well built of stone, and whitewashed. Ulverstone has long been noted for its manufactures of checks, canvass and hats. The principal exports are blue slate, got in the neighbourhood, of which immense quantities are sent coast-wise, and iron ore, obtained at Lindale. Great quantities of potatoes are raised in the neighbourhood, and the land seems peculiarly adapted to the cultivation of this valuable root. A canal, connected with the river Leven, was cut here in 1795. It is about a mile and a half in length, with proper basins and wharfs, and opens an immediate communication with the Irish sea. Population of Ulverstone in 1841, 8778.

W

WALKER Thomas; author of a somewhat eccentric collection of essays entitled "The Original," was born in Manchester, in 1784. His father was an extensive manufacturer there, but at the outbreaking of the French revolution, got involved in the political agitation of the day, and was tried for high treason at Lancaster. The trial is still memorable for lord Erskine's splendid defence of the accused, which obtained his acquital. Young Walker, after graduating at Trinity college, Cambridge, studied for the law, and was called to the bar in 1812. In 1829, he was appointed one of the magistrates of Lambeth street police office, and till his death discharged the duties of that station with great practical wisdom and efficiency. In May, 1835, he commenced his weekly periodical, called The Original, which ran the length of twenty-nine numbers. The essays were mostly on ordinary day life, but, drawing from his experience as a magistrate and one who had mixed largely in the world, the author contrived to infuse into them many new and striking observations. Mr Walker died suddenly at Brussels on the 16th January, 1836.

WEALDIN. A geological formation, so called from its existence in the Wealds of Kent. These strata are found resting above the oolite and under the chalk in the counties of Kent, Sussex, Surrey, and Hampshire. They extend in England in length to sixty miles, and are from fifteen to twenty miles in breadth; the same, or similar beds can also be traced to Boulonnois on the opposite coast of France. They rest on marine beds and are covered with marine green sand, but contain remains of fresh water animals exclusively. The beds consist of a blue or brown tenacious clay, sometimes indurated, slaty, and mixed with beds of limestone, containing shells of the paludina and cypris, and other fluviatile mollusks. Also remains of fish, turtles, as the triomyx, crocodiles, the plesiosaurus, hylœosaurus, megalosaurus, a gigantic species of lizard, approaching to the form of the existing monitor, and supposed by Cuvier to have been seventy feet in length. The teeth and bones of the iguanadon, an herbivorous reptile, somewhat similar to the guana, a lizard of the West Indies, have also been found in these beds. The teeth resemble the grinders of an animal adapted to feed on vegetable matters, and many of these are worn flat by attrition. From portions of a huge thigh bone discovered, and measuring twenty-three inches in circumference, the animal to which they have belonged has been conjectured to have been at least sixty to seventy feet in length. It appears also to have been furnished with a horn similar to that of the rhinoceros. Bones of birds have also been found, but none of the mammalia. At the point of contact of the inferior division of the wealdin, or purbek beds, with the more ancient marine system, a very curious phenomenon is observed. The fresh water calcareous strata repose both in Portland and purbek upon the oolite limestone, called the Portland stone which abounds with ammonites, trigoniæ, and other marine shells. Between the two formations there intervenes a layer of what appears to have been an ancient vegetable soil; it is of a dark brown colour, contains a large proportion of earthy lignite, and like the modern soil on the surface of the island, many water worn stones. This layer is called the "dirt bed" by the quarrymen, and in and upon it are a great number of silicified trunks of coniferous trees and plants allied to the recent cycas and ganua. Many of the stems of the trees as well as the plants, are still erect, the former having their roots in the soil, and their trunks extending into the superincumbent strata of limestone. Traces of this vegetable earth have been observed in the cliffs of the Boulonnois, on the opposite coast of France, with the stems and roots attached to it in a similar manner as those found in the English wealdin.

In the wealdin too, will be found a good illustration of the effects of denudation of the superior strata. The chalk and green sand above having been extensively swept away by currents, by which the weald clay below has been exposed, the legs of birds, remains of fishes, crabs, lobsters, marine shells, and fuci with portions of fossil wood, have been discovered.

WEAVING, (*a.*) In our former article, we contented ourselves with giving merely a succinct summary of a few of the processes connected with weaving. We shall now enter more into detail on the subject, both as regards its history, and the mechanical process by which it is carried on. Among all barbarous nations, weaving consists of warping and crossing grasses, and such rude materials as are most easily obtained. This is weaving in its most primitive state, and is purely darning. The long threads running from end to end of the piece, are called the warp. The cross ones interlacing from side to side, the weft. Cloth may be wrought in this way, but it must be at an immense cost of time. In the method of weaving by darning, every alternate thread of the warp must be lifted by itself to put in the weft shot, and the process is therefore very tedious. If, however, a method were invented for lifting up a certain portion of the warp at once, which is called shedding the web, to receive the weft shot, this would be a great saving of time, and this is weaving in its second stage. Weaving in this state exists among all partially civilized nations. Among the Egyptians, East Indians, Chinese, and others, weaving has existed in this state from time immemorial. These countries are admirably situated for carrying on the manufacture. They have abundance of the best material for the purpose. The silk of China, the cotton of India, the flax of Egypt, and the wool of Asia Minor, afford inexhaustible and beautiful materials for the manufacture of cloth. Hence they have been distinguished for the weaving of various fabrics, from a very early period.

The writers of the old Testament make frequent mention of the fine linen of Egypt and the purple of Tyre. Among the Chinese the weaving of silk was carried on as early it is believed as B.C. 2700, and Herodotus, the oldest of the Greek historians, who wrote B.C. 445 informs us that cotton cloth was the common dress of the inhabitants of India. "He says," in speaking of this people, "that they possess likewise a kind of plant, which instead of fruit produces wool of a finer quality than that of sheep; of this the natives make their clothes." It is obvious from his manner of speaking of the material, that he was wholly unacquainted with the nature of cotton, and likewise that it was then unknown to the nations of the west of Asia. He indeed expressly says, that the dress of the Babylonians was of wool and of linen, and that of the Egyptians of linen only; except that the priests, when not engaged in their sacred ministrations, wore a white woollen shawl. Among the Greeks at the time of Herodotus, and long before, linen and woollen cloth to a small extent was fabricated. But Europeans then, were far from being celebrated for their manufactures. The beauty of the productions of the east, distanced all competition with the west. The fine figured fabrics, especially the silks of China, were bought by the Greeks and Romans at extravagant prices, even for their weight in gold. This commerce, however, was very uncertain, frequently interrupted by wars, and thus the western world was in danger of being entirely deprived of these beautiful fabrics. The silk worm was introduced into Europe, A.D. 552, (see *Silk*,) and the trade fostered by the emperor Justinian. It nevertheless made very little progress in Europe, scarcely undergoing any extension for 600 or 700 years. The progress of manufactures at this period was remarkably slow, and the cotton manufacture is more remarkable in this respect than even the silk. From the time in which it was first noticed by Herodotus, till it made its way to the eastern shores of the Mediterranean sea, a period elapsed of at least 500 years. The manufacture must have been carried on in the early peopled regions of the East Indies, where cotton is indigenous long before any record was preserved of their transactions. And yet by the time of Strabo, A.D. 25 the next Greek author who mentions our subject, we find that it had spread westward only as far as Persia. This historian says, that in his day cotton grew, and cotton cloth was manufactured in Susiana, a province of Persia, at the head of the Persian Gulf. And Pliny, fifty years later informs us, that it had then spread into Egypt. He says, "in Upper Egypt, towards Arabia, there grows a shrub which some call Gossypium, others Xylon, from which the stuffs are made which we call Xylina. It is small, and bears a fruit resembling the filbert, within which is a downy wool, which is spun into thread. There is nothing to be preferred to these stuffs for whiteness, and softness. Beautiful garments are made from them for the priests of Egypt." And yet this manufacture, so admirably adapted for the clothing of the inhabitants of warm countries especially, made very little further way westward for about 1300 years.

The art of weaving was unknown in Britain before the Roman invasion. On the landing of Julius Cæsar, he found the natives almost without clothing, and the little that they wore consisted of the skins of animals, a great part of their bodies being naked, and painted with various colours. The Romans established a woollen manufactory at Winchester for clothing their army, and also taught the natives the art of weaving. The party coloured stuff called tartan, which is supposed to have been first made when the natives abandoned the practice of painting their bodies, together with a pretty close resemblance of the Roman garb, have been preserved by the highlanders of Scotland to the present time. The culture of flax and the manufacture of linen are also said to have been introduced by the Romans; and the natives were afterwards taught the art of weaving several kinds of cloth, chiefly for domestic purposes, by the Saxons.

Very little further is known relative to the progress of weaving in Britain, till the reign of Edward III. when several laws were enacted in favour of the woollen manufacture, and every possible encouragement given to foreigners by that monarch to settle in Britain, in so much that, from this period, the woollen manufacture has ever been considered the staple of England.

On the continent of Europe the cloth manufacture had been carried to a very great extent; in so much, that in the year 1305, the city of Louvain, in Flanders, with the adjacent villages, was said to contain 150,000 journeyman weavers; but which lost its manufactures about seventy years afterwards by an insurrection. In 1567, the persecutions under the duke of Alva, in the Netherlands, drove many people into England, who introduced the manufacture of baizes, serges, and several other stuffs. But the great era in the history of the useful arts in Britain is about the years 1685 and 1686, when 70,000 refugees are said to have come over from France, on the revocation of the edict of Nantz, and brought with them an extensive knowledge of many manufactures with which we had been hitherto unacquainted. Of these, many went to Ireland, and numbers settled in Spitalfields, London, where they established the manufacture of silk.

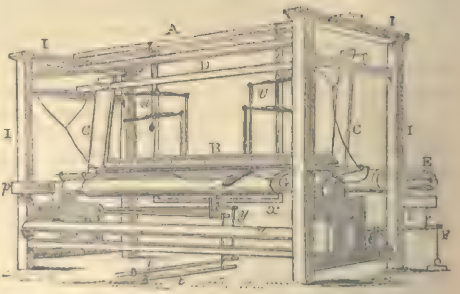
The cloth manufacture made very little progress in Scotland till after the union. About the year 1759, a branch of the silk from Spitalfields was established at Paisley, when it was soon brought to such a degree of perfection, especially in the light and more fanciful fabrics, that Paisley silks obtained a preference in all the markets of Europe; and laid the foundation for that extensive branch of fancy weaving which has since spread itself over the west of Scotland.

About the year 1767, Richard Hargreaves, a weaver in Lancashire, invented the cotton jenny for spinning wool; and about two years afterwards, the late Sir Richard Arkwright applied power to the spinning of warps, which greatly accelerated the cotton manufacture in England.

Weaving is performed upon a *loom* which is merely a frame for the purpose of stretching out the warp or web that is to be made into cloth. The web, which is of any convenient length, is kept stretched between two beams. The one beam on which the web is wound, is called the yarn roll, and the other on which the cloth is wound, the cloth beam or roll. The Indian loom is, probably, the most ancient now to be seen in action, and when we take into account its wonderful simplicity, we may well be astonished at the beautiful fabrics produced upon it. The Indians prepare their cotton for spinning, by separating it with the string of a bow, which is kept vibrating by the hand until its fibres are opened into a fine down or fleece. The method of spinning, even their very finest yarn, is still by the distaff and spindle. In weaving muslins of the most delicate fabric and texture, their apparatus is equally simple. The warp is stretched between two rollers, under the shade of some convenient tree, and over a pit that has been dug for the purpose. What constitutes their heddles is suspended from a bough; and two loops, into which the two great toes are introduced, are formed on cords below, and serve instead of treadles or other mounting. The woof is inserted by a kind of long shuttle, which also performs the office of our reed and lay, by which we shut up the woof. In weaving their more fanciful and complicated patterns, the warp is also wound upon a roll, which is frequently suspended between two trees; and, being equally stretched in a vertical position by another roll below for receiving the cloth, the woof is inserted by a long needle, which is dexterously employed by the operator in secluding such of the warp threads as are raised by our mountings. This process has some resemblance to our method of reading an extensive flower on the simple of a harness. When the threads of woof are thus interwoven with the warp, which are often linked into each other in a very curious manner, they are drawn close to the face of the cloth by another instrument similar to a comb.

In the common hand loom, the beams upon which the warp is extended, are kept parallel by the frame of the loom I I, and as the cloth beam G, winds the web off the yarn roll E as it is woven, it is obvious that to draw alike they must be perfectly true.

Fig. 1.

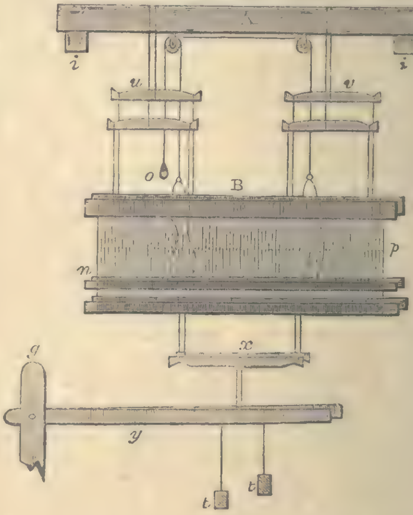


The following is a description of the several parts of the hand loom.

A,	The *heddle bearer*, from which the rinks or jacks are suspended.
B,	The *heddles*.
u, *v*,	The *jacks* or *rinks* attached to the upper shafts of the heddles, which enables them to move upwards and downwards, when acted upon by the treadles.
x,	The *knee shafts* attached to the under shafts of the heddles.
y,	The *marches* connected with the knee shafts above, and the treadles below.
t, *t*,	the *treadles*.
C, C,	The *swords* of the *lathe* or *lay;* the boxes for receiving the shuttle, are seen on the outside of them; the picking pin for driving the shuttle is lying on the cloth roll, the cords suspended from the sides of the loom, are for supporting the driving cord.
D,	The *rocking-tree* to which the lathe is attached by cords, and which vibrates upon bars at the sides of the loom.
F,	A *lever* and *weight*, to which a rope passing round the yarn roll, is made fast in order to keep the web at a proper tension.
z,	A board on which the weaver sits when at work.
p,	the *pirn* or *bobbin box*.

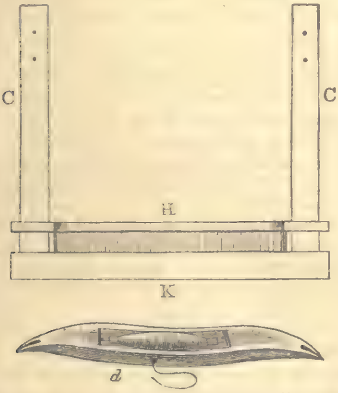
In front of the loom, about fifteen inches from the cloth beam, is an apparatus fig. 2, for the purpose of shedding the web, or opening the threads of the warp for the weaver to throw in the shuttle and interlace the weft. This apparatus is called the heddles, B, and consists of a framing of cords laced over two wooden shafts. There is a cord or single heddle for each thread in the web, and

Fig. 2.



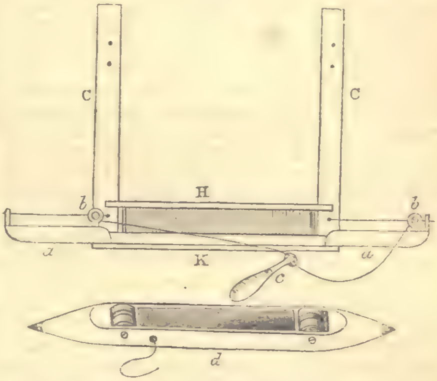
the thread is taken through a loop or eye in the middle of the heddle, represented by the medial line *p*. It will be seen then that these heddles are in two halves or parts, called leaves; and if one half is lifted up, the web will be divided into equal portions, one thread up and one down alternately all the web over. This is the shedding for plain work. The heddles are hung upon levers or jacks *u*, *v*, to admit of the rising and sinking motion of the leaves, that shedding may take place. This is accomplished by the weaver's feet, by cords attached from the lower side of the heddles to levers called treadles *t t*, one cord to each treadle. The weaver places his feet upon these treadles, and pressing down one, raises all the warp that is attached to it, and in this manner the shed is formed for the introduction of the weft shot. The weft shot is introduced or carried through the shed by an instrument called the shuttle, seen at *d*, figs. 3, and 4. This is a kind of wooden carriage, tapering at each end. The size of the shuttle varies according to the work for which it is intended. For the medium fabrics of cotton, it is about 12 inches long, 1 broad, and ⅝ thick. It is hollowed out in the middle for the reception of the weft, which is wound on a bit of turned wood called a *pirn* or *bobbin*. The weft unwinds from this pirn as the shuttle runs from the one side of the web to the other. The weaver then taking the shuttle between his finger and thumb, throws it into the shed and receives it on the point of the fore finger, at the other side of the web. He must now have some means for driving home the shot. This is done by what it is called the reed, which is like a fine comb formed of flattened pieces of fine wire. There are two threads of the warp through each of the teeth, or dents, and to give effect or strength to the reed to drive home the shot with any required force, it is fastened in a frame called the lay, lathe, or batten. The lay, represented in fig. 3, is supported from its centre by the two swords, C C, it vibrates like a pendulum, and the weaver taking hold of the cap of the reed H with his left hand, moves the lay back towards the heddles; and having formed the shed, throws the shuttle through it to the other side of the web. He then rapidly brings the lathe forward to the verge of the cloth, or fell,* and strikes home the shot.

Fig. 3.



This is weaving by what is called the hand shuttle, and weaving in its most improved state as practised in England and in Europe generally, till the year 1738, when the method of weaving by the fly shuttle was invented by a mechanic of the name of John Kay, belonging to Bury in Lancashire. This invention was a great improvement, the greatest that has been made in the mode of weaving by the hand loom, since the invention of the method of shedding the web by heddles, and yet it is very simple. Fig. 4, is a representation of this lay, with the fly-pin *c*, and fly-cord shown.

Fig. 4.



In weaving by the hand shuttle, both of the hands are employed in turn, in throwing the shuttle from side to side; or as it is called in Scotland, shuttling, and in England, picking. The hand that is disengaged alternately seizes the lay, and drives home the shot. There is here therefore a constant shifting of hands, and a great deal of time lost; besides unnecessary labour. All these inconveniences are wholly removed in weaving by the fly shuttle. The weaver has one hand exclusively for shuttling, and the other for working the lay. He gains therefore ease in working, with greatly increased speed.

The old hand lay before it was improved by Kay, is shown at fig. 3. And in referring to the representation of the fly shuttle lay, at fig. 4, the difference will be obvious. It will be seen that there is a *projection* on each side of the *lay* beyond the *swords*, which is merely a continuation of the *race* on which the shuttle runs. This is called the box *a*, and is made for the purpose of receiving the shuttle, as it comes through the shed, when the weaver drives home the shot, that it may be in immediate readiness to be projected back again. There is in the box a little piece of wood called the *driver b*, or in England the picker, which slides freely from end to end of the box on a *spindle*, and is kept steady by a tenor or tongue, working in a slit in the race below. This is the apparatus for propelling the shuttle, with which, of course, each side of the lay is furnished; and they are connected together by a *cord* called the fly cord. The weaver then has a *handle* called the fly pin, *c* fixed to this cord, with which, by a sudden jerk, he throws the shuttle from the one side to the other, as fast as his art and strength enable him. In order to diminish its friction, the shuttle, is generally mounted on two rollers. He may by this method project the shuttle in a yard wide web easily at the rate of 140 shots per minute. His speed is limited only by his strength and the art with which he can manage the yarn. The hand loom therefore, is perfected by this method so far as motion is concerned; and the gain by the fly shuttle over the hand shuttle taking all sorts of work into consideration, may be about four fold.

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* The fell is that part of the web which is being made into cloth, where the last shot was thrown in—the verge of the cloth.

Sir Richard Arkwright, as formerly mentioned, succeeded, A.D. 1769, in the application of power to the spinning of cotton. His career was so signally successful, that it drew the attention of all men to the importance of mechanical applications. He showed the capabilities of machinery, and the spindle soon became so amazingly productive, that the loom was wholly unable to co-operate with it, or consume its supplies. A loom therefore to go by machinery was eagerly sought after; but supposed to be an impossibility. Most of the ingenious mechanics in the manufacturing districts in England and Scotland, however, entered earnestly upon the subject, to invent what is called a power loom; that is, a loom wherein all the motions of weaving, the throwing of the shuttle, the working of the lay, the shedding of the web, and the turning of the cloth beam, are combined in one centre, so that when this centre is moved, by any application of power, weaving will be the result. This great mechanical problem was first proved to be practicable by Dr Edmond Cartwright, a clergyman of the church of England. He had been visiting at Matlock, in Derbyshire, and dining in the public room there, the conversation ran on Mr Arkwright and his patents. Some of the gentlemen observed, that if the trade were thrown open, it would be over done by the number eager to participate in the profits of cotton spinning, so that in forcing sales abroad we should be raising up a competition which our weavers could not withstand. The Dr said Mr Arkwright must invent a loom to go by machinery. They all affirmed that that could not be done. The Dr stated some reasons why he thought otherwise, and the subject made so deep an impression upon him, that he immediately set about the invention of a power loom, and brought one out by patent, in 1787. He took out in the year following a second patent for further improvements, and removed to Doncaster, to carry his invention into effect, but he failed in applying it. Notwithstanding that Dr Cartwright was eminent for mechanical and intellectual power, and continued to apply all his energies to the subject for many years, he was forced to abandon it, after he had expended above £30,000 in his attempts to render it available to the trade. The cause of his failure was apparently a trifling one, but in reality very important in weaving by power. It was the want of a means to prevent the breakage of the yarn, by the accidental stoppage of the shuttle in the shed. Without a good means for this purpose, the power loom is useless, and Dr Cartwright was totally foiled on this point. But the belief of its practibility was so far established, that two gentlemen, of the name of Grimshaw, belonging to Manchester, took up the subject, with the view of making some improvements upon it, but so strong was the feeling against the application of machinery to weaving, arising from the mistaken notion that it diminishes the demand for hand labour, that in 1792 the mill was wilfully set on fire, and burned before the looms were properly fitted up. This hostile feeling to the introduction of machinery retarded its progress in England; but in Scotland, where, from various causes, it was much moderated, we find the power loom making its way as a native invention, before it was abandoned by Dr Cartwright in England. Dr James Jeffrey, the present (1840) professor of anatomy in the university of Glasgow, a man of great reflective power, had been directing his attention to the invention of a power loom, at least as early as Dr Cartwright, and while he was practising in Paisley, in 1787, brought out his power loom, and wrought a piece of cloth by it, without knowing what was doing in England. Dr Jeffrey however, did not prosecute his invention, but it was soon taken up by several ingenious mechanics, among whom was Mr Miller, who managed a bleaching work at Milton, near Dumbarton, belonging to Mr Macdonald, provost of Glasgow; and Mr Miller has the very great merit of rendering the power loom a useful invention. He greatly altered its construction, and invented a beautiful means for the purpose of preventing the breakage of the yarn, by the accidental stoppage of the shuttle in the shed. This invention is called the protector, and so effective and complete is it, that the power loom is now enabled to perform all the motions of weaving, uninterrupted by accidents of this sort.

The general arrangements for weaving by hand, and by power, to a certain extent, are the same.

Plate XCIII. fig. 1. is a side elevation, and fig 2. a front elevation of a power loom of the common construction; the letters of reference are the same in both figures. A A, are two pullies, one of which is fast, and the other loose, upon the spindle B B. The belt that drives the loom is shifted from the fast to the loose pulley, or from the loose to the fast one, as the loom requires to be stopped or set agoing. C C the lay, which moves upon the centre spindle D D. The lay is worked backwards and forwards by two cranks on the spindle B B, which are attached to the lay by two connecting rods, one of which is seen at *e*. On the spindle E, are four wipers for working the treadles; the wipers commonly consist of eccentric wheels, or plates, with a friction roller, on a stud, projecting from the side as shown; as the spindle turns round, the friction rollers come in contact with the treadles, and forces them down. In common weaving there are four treadles used; two of them give motion to the shuttle, the other two are for working the heddles, so as to produce the shed. To work the shuttle a belt, connecting the one treadle with the other, passes over the pulley L; to this pulley the picker pin *z* is attached, from the extreme end of which a cord reaches to each of the drivers *d d*. Hence, as the one treadle is forced down, the pulley L will make part of a revolution, making the picker pin *z* fly from the one side to the other, pulling the driver along with it, and throwing the shuttle across the web. The other two treadles work the heddles, in the same manner as in the hand loom. As the lay makes a double stroke, that is, backwards and forwards, every time that the shuttle and heddles make a single movement, it will be evident that the spindle B B, must make two revolutions for every one that the spindle E makes, so the number of teeth in the wheels M and N N, must just be in that proportion. Y, the yarn beam, which has a pulley at both ends; round each of these pulleys a friction cord, reaching from the floor, takes two or three turns, the other end being made fast to the levers

X X, on which the pace weights W W hang. H H is the beam on which the cloth is wound, as it is wove. T, a toothed wheel fixed on the spindle of the cloth beam, which is driven by a pinion attached to the ratch wheel O P R. This ratch wheel is worked by the ratch P, which is acted on by the weight R. This weight is not sufficient of itself to turn round the cloth beam when counteracted by the friction cords on the yarn beam, but when the lay strikes home the weft, it must at the same time press forward that portion of the cloth that is woven at each stroke; which portion, thus relieved, is then taken up by the cloth beam. In order to raise the weight R, as it must fall a little way every stroke the lay makes, there is a pin *h*, projecting from the sword of the lay which takes hold of the arm S, as the lay moves backwards, and so lifts the weight up, while at the same time the two stop catches shown, catch the teeth of the ratch wheel, to prevent the cloth beam from unrolling, as it would do when the weight R was being lifted.

Fig. 3. is a detached view of the protector. As the shuttle often stops short in its progress through the shed, the use of this ingenious contrivance is to prevent the lay from getting forward to the fell unless the shuttle has got fairly across the web and entered the opposite box. In both boxes of the lay there is a wooden slot, that projects inwards through the side. As the shuttle enters the box, it forces the slot outwards; which acts on the bent lever *k*, so as to make it lift the catch V. If the shuttle is stopped in the web, it would not then press out the slot, and as the catch V would not be lifted, it would catch on the stop S, and prevent the lay getting forward, the stop S being only allowed to shift so far as to detach the handle *a*, from a notch which confines it, when it immediately (from the spring that it has) acts on the lever *f f*, and shifts the driving belt on to the loose pulley, and thus stops the loom. When things are put to rights, the attendant takes hold of the handle *a*, which is best seen in fig. 2. and shifts it back into the notch, and thus sets the loom again to work.

The motion of the loom begins by the turning of the crank withdrawing the lay from the fell; and while this is being done the shed is forming by the simultaneous action of the wiper shaft. When the lay has got about an inch and a half from the fell, the wipers for working the shuttle are so placed on the shaft, as then to strike the shuttle treadle, and by suddenly forcing it down, communicates the impulse by which the shuttle is thrown across the web. By the time, then, that the shuttle gets out of the box, the shed is sufficiently formed to receive it, and the lay continues slowly to recede backwards till the shuttle has got to the middle of the shed, when it returns again to the fell to strike up the shot.

The motions of the loom, as will be seen, are all produced by the rotation of the crank shaft; and although there is a great difference in the arrangements of the moving parts in the various power looms, there is no difference in the application of the power.

The following is a description of a power loom, of a different construction, manufactured by Messrs Sharrocks and Birch, engineers, Manchester, by whose permission the drawing has been made. It is applicable for weaving cloth, either of cotton, silk, or wool.

Plate XCIV. fig. 1. exhibits a front elevation. Fig. 2. is a plan or horizontal view as seen from above, and fig. 3. Plate XCV. is a side elevation of the same.

This power loom was invented by a native of Saxony, named Schonherr, and was imported into this country, and subsequently protected by letters patent, by Mr Hamer Stansfeld of Leeds.

It will be observed that in the three figures representing the loom in different views, there are similar letters of reference marked upon corresponding parts of the machinery. *a*, *a*, *a*, is the cast iron general framing of the loom. *b*, the beam or roller upon which the warp is wound, called the yarn beam. *c*, *c*, the heddles or healds through which the yarn threads are divided or drawn apart, to form a passage for the shuttle. *d*, *d*, the lay, containing the reed for beating up the cloth. *e*, *e*, the shuttle box containing the shuttle which carries the weft thread. *f*, the breast beam over which the cloth passes on to *g*, the cloth or work beam, upon which the cloth is wound as it is made. *h*, strap for taking up the cloth upon cloth beam. *i*, main driving pulley for setting the loom in motion. *j*, shaft and wheels for working the picking and shedding motions. *k*, cam for giving the shedding motion. *l*, cam for giving the picking motion. *m*, treadles and cams for dividing the heddles. *n*, spring for bringing back the lay. *o*, setting on rod for putting strap on fast driving pulley. *p*, motion for throwing the whole out of gear, and stopping the action of the loom when the shuttle misses its box and does not put in any weft. *q*, picking stick for throwing the shuttle.

The patent loom is stated to possess the following advantages:

1. Requires hardly half the power, but, by a more appropriate distribution of it, puts in the weft with double the force. It can be worked by the hand, foot, or strap; it has only three wheels and one wrought iron shaft two feet long, and the common power loom has eight wheels and two shafts each four feet. 2. Causes a great saving in friction and tension, the shed being only 3¼ inches long, and 1½ deep. 3. Takes up less room. 4. Gives out the warp, and takes up the cloth, with a regularity superior to any other mode, and requiring no alteration. 5. Causes a great saving in pickers, and no oil for the shuttle box is necessary. 6. All the motions are so gentle and steady, that the most delicate article may be woven by this loom, and also the strongest goods. The first view of the loom would lead a person ignorant of its principles to suppose, from its light appearance, that this were impossible; but the fact of the most difficult quality of linen having been woven by it in a superior manner, and undressed too, proves the correctness of this statement; a double pressure or blow can be given if requisite; fewer threads break, say in the proportion of 1 to 20; no thin place occurs when working without weft, and altogether a decidedly superior article is produced; equal if not greater speed can be obtained, than in ordinary power looms.

The great object of all mechanical arrangements for weaving is to introduce the shot as rapidly as possible with the least injury to the yarn. This is the great rule that should guide the weaver or the mechanic in all his attempts to deal with this subject. The first consideration is the *safety of the yarn.* With this view the yarn should be stretched in the loom in such a manner as to suffer the least possible strain by the motions of weaving. The beams should be parallel, true, and placed very nearly on the same horizontal plane. The stretch between the two beams should not be longer in power looms than to give a sufficient spring to the yarn in forming the shed. As the shed is much bigger in coarse than in fine work, the length of the stretch should vary accordingly. It is of great importance in weaving fine work, to have a short stretch. Hand-looms have invariably too long a stretch; and power looms generally too short. There is a want of adaptation in both cases, arising from opposite reasons. To get as many looms as possible in his factory, the manufacturer by power diminishes his stretch without perhaps being aware of the disadvantage. The hand-loom weaver increases his stretch to get as much yarn as possible dressed at a time. The power loom weaver's yarn, therefore, snaps suddenly from insufficient spring when a knot in the thread comes in contact with the reed. In hand weaving the yarn gives way by the strain it sustains in the length of the stretch. Moreover, to keep the yarn sufficiently tight, heavy pacing is necessary, and this greatly increases the evil.

The next *consideration is to save the yarn, by dispensing with all excessive and harsh motion.* Of all the motions of weaving, the shedding of the web is the most severe on the yarn. This motion therefore should be perfectly smooth; and the shed sunk no deeper than will barely admit the shuttle. Three rods are put in behind the heddles to keep the yarn firm, and preserve the lease. The first two preserve the plain shed, and the third, which is properly the lease-rod is put in to a shed formed with two threads above, and two below the rod all over, for the purpose of binding the yarn still more together. These rods should be placed as far behind the heddles as the heddles are from the fell, but no further.

The motion of the lathe in power looms is very often bad. The best arrangement for this purpose is to hang the lathe like a pendulum, after the manner of the hand loom weavers. And to fit the lathe for working well at any speed, the length of the swords, or the radius of the arc which the lathe describes, should be increased or diminished accordingly. For narrow work with a great speed, the swords should be shortened, and lengthened for broad work where the speed must be diminished. In power loom weaving, this position of the lathe is usually reversed; it is generally placed inverted with its centre of motion below the web. The only advantage arising from this arrangement, is that it renders the loom more compact than it would be by the hanging lathe; and the motion, although not really so good, cannot be called injurious to the coarse work, for which the loom is fitted. In other power looms, such as the one last described, the lathe is without swords, and slides backward and forward on two guide rods. This motion, however, is so far objectionable, as it wants firmness and smoothness. For, let the guide rods be ever so well fitted, they must have some play, which will increase by wear, and therefore the lathe must suffer much shaking from this cause, independent of its inability from position, unsupported by leverage, to withstand the shock of the fell. The lathe in the eccentric power loom has swords in the usual manner, and motion is communicated to it by an eccentric spur wheel and pinion instead of the common crank. This motion was invented and patented by Mr Archibald Buchanan of Catrine, in Ayrshire; but had also been invented some years before Mr Buchanan, by a mechanic of Glasgow, and used in the north of Scotland for the weaving of sailcloth. It will be observed, that the motion communicated to the lathe by the connecting rod from the crank, has a pause in turning the centre at each side, of nearly equal duration. Now this is not the motion that the weaver wishes. He requires a long pause in the motion of the lathe when the shuttle is traversing the shed, and a very short one on striking the shot home, and therefore the hand loom weaver, to gain speed, moves the lathe quickly from the fell, that the shuttle may be admitted into the shed as soon as possible, and then slowly retards the motion of the lay. Mr Buchanan accomplishes this motion by his means; but there is always a perceptible harshness of action in the motion of the lathe by the eccentric wheels; which is increased when the form of the wheels is not good and the speed high. Now this very motion, without any drawback, is accomplished by the crank itself, merely by placing the crank shaft lower in the loom than that part of the lathe to which the connecting rod is attached for the communication of motion from the crank. This adaptation therefore, of the crank, renders Mr Buchanan's eccentric motion entirely useless.

The motion of the cloth beam is likewise various, but it is usually accomplished by the sword of the lathe. The lever which communicates motion to the cloth beam, is so placed as to lie within the traverse of the lathe; which as it vibrates, pushes it out of its way, and thus gives motion to the beam. This method of taking the motion is objectionable in so far as it has a tendency to disturb the action of the lathe; it may, however, be easily remedied, as is frequently done, by taking the motion from one of the two shafts.

Weaving, of cotton especially, consists of two processes; weaving, properly so called, that is, the motions for interlacing the warp and the weft; and the preparation, or dressing of the yarn for being woven. The rapid rotation of the spindle on its axes in twisting the thread, throws out by the centrifugal force of the motion the ends of the fibres on its whole surface. The threads are therefore very rough, and if brought in this state to be woven, they would entangle each other in the shedding, and the whole web in a short time would be a mass of breakage. The object of dressing is to lay these fibres along the surface of the thread, and thereby strengthen it to stand the process of weaving. This process was done by hand in the power loom, by the weaver who had the charge of it while the loom was going on. The yarn, therefore, was sustaining the action of two processes at once, and the breakage thereby was not only greatly increased, but the work likewise must have been imperfectly done. The only gain in weaving by power is by enabling one person to manage more than one loom; when one individual was indispensible to each loom, it would have been better to have allowed the weaver to dispense with the machinery altogether, and weave by the common method; and indeed, this is the result that must have taken place, but for the invention of the dressing machine. This great invention, which rendered the power loom successful, was originated by Mr William Radcliffe, a cotton manufacturer of Melor in the neighbourhood of Manchester, about the year 1800.

In the first dressing machine, which was invented by a Mr Johnson under the superintendence of Mr Radcliffe, the yarn was dressed by being drawn over a revolving circular brush. This method of dressing, however, did not prove satisfactory, and was laid aside. Mr Johnson, afterward, on the suggestion of Mr Radcliffe, endeavoured to give motion to the brush in a manner similar to working it by hand; and in this attempt he succeeded. He caused it to slide or traverse on two spindles, one at each end, communicating motion to work it backward and forward by a strap; and as the brush was to act on the yarn in one direction only, it was lifted off the web at the end of the stroke by an eccentric. This plan was found to answer the purpose tolerably well, and machines on the principle of Mr Johnson's two inventions, with some improvements, are those which are still chiefly used by the trade.

The dressing machine is a long frame a little wider than the breadth of the web intended to be dressed. One end and the centre of this machine is shown in plate XCV. fig. 4.; the other end, being similar, is not given. The yarn intended to be dressed, is wound upon the reels *a a a a*. In order to keep the machine working with as few interruptions as possible, there is generally about ten or twelve webs, of a hundred yards each, put upon the reels at once. A A is the frame which carries the yarn rollers *a a a a*, as prepared at the warping mill. They are fixed at successive heights, in order to keep the yarn from the one clear of the other. The yarn of all the four rollers is carried through a reed, *d*, formed of brass wires, an enlarged view of which is seen at fig. 6. Behind the reed *d* is a small roller *e*, which revolves by the friction of the yarn as it passes along, and serves to collect the warp of all the beams in one horizontal plane. *b* is a large wooden cylinder, turning on friction rollers immersed in a wooden trough *x*, which is filled with paste made of water and flour boiled together, to about the thickness of honey. The cylinder *b* is pressed by a smaller one *c*, of iron, which is sheathed with copper, to prevent its oxidizing by the paste, and covered with thick woollen cloth. As the warp is drawn forward, the cylinders *c* and *b* squeeze out the superfluous part of the paste which had been supplied to it from the trough *x* by the larger cylinder. From the cylinders *c* and *b*, the warp *f* proceeds through the reeds D D D under the roller *k*, up through the heddles *w*, and the large reed E, to the yarn beam *l*. The portion of the warp at the other end of the machine, proceeds in like manner through the corresponding parts, and is also wound on the yarn roll *l*. The lease of the web is preserved by the heddles *w*, and to prevent the threads from adhering to one another, and make it easier for the dresser to separate any broken ones, the warp is separated by the lease rods *i i i*. The brushes *g* and *h* are placed one above and the other below the yarn, that it may be more equally dressed by being brushed on both sides. They are set in motion by the levers *p* and *o*, which are wrought by the connecting rods *q* and *r* from cranks on the main shaft C. *n*, is a counterweight on the opposite end of the lever *m n*, to balance the weight of the brushes. The one connecting rod gives the reciprocating motion to the brushes necessary in dressing, and the other regulates their horizontal action on the yarn, and withdraws them from the warp at the termination of the stroke, to prevent chafing by brushing backward and forward. The brush is seen detached in fig. 5. and is always fully longer than the breadth of the web. The drying of the yarn is accomplished in the following manner. Two steam pipes open into sheet iron cases, indicated by dotted lines at 4, 4. F F is a fan with three leaves working between the warp, from each end of the machine on its passage from the rollers *k k* to the yarn roll *l*, and blowing the hot air from the iron cases against the expanded warp, tends to dry it very powerfully. Motion is communicated to the fan, by a strap passing over the pulley B from the pulley M, which latter is moved by a strap passing over the pulley L (seen in dotted lines) from the large pulley K, which is fixed on the main shaft C, along with the fast and loose pulley I, and by a belt over which from the moving power the whole machine is driven.

As the progress of the warp through the machine is caused by the revolving of the yarn beam *l*, it is evident that as its diameter increases by the winding on of the yarn, the speed with which the warp would pass through the machine would be thereby continually accelerated, and would not be sufficiently dried before it was wound on the beam. In order to equalize the motion, the following arrangement is adopted. On the shaft C is placed a conical pulley *s*, and on a short shaft at the under part of the machine is placed a similar conical pulley G, having its greater and lesser diameters in a reverse direction to the former, and which is driven by a strap passing over it from the cone *s*. This strap is kept in its position on the cone *s*, by the guide *w*, and by means of the handle *v*, moves the strap from the larger to the smaller diameter of the cone *s*, and from the smaller to the larger diameter of the cone G, if the speed of the yarn beam *l* is to be lessened, and the contrary way when the speed is to be increased. On the same shaft with the cone G, is placed a small pinion (not seen in the engraving,) which works into the wheel *y*. Fixed to the wheel *y* is a small bevel wheel *z*, working into a similar bevel wheel on the lower end of a shaft, sloping upwards, (indicated by dotted lines,) which, by means of the bevel wheels 1 and 2, and the catch 3, seen in the detached view, fig. 7, turns the yarn beam *l*. The small roller *k* with the bell attached to it, is the means for measuring the quantity dressed. This roller changes the direction of the yarn to the beam *l* above it; and therefore turns with the yarn. When its diameter is known, so many turns will give a certain length of piece; and as the roller works the wheel 5, so many times slower than itself, every turn this wheel makes, strikes the bell 6, and indicates the quantity required, or the length of the piece.

In other modifications of this machine, the roller *b*, in place of wood, is formed of cast iron cased with copper, and covered with cloth in the same manner as *c*. And instead of receiving its motion from the yarn-beam *l*, through the medium of the warp, it is driven by gearing in connection with the main shaft C, whilst the yarn beam accommodates itself by means of a friction wheel, to wind up the warp, only so fast as it is permitted to pass with an equable motion between the rollers *b* and *c*. The brushes move backward and forward on guide-rods fixed to a frame turning on a centre, and receiving an up and down motion from a wiper; the reciprocating motion being communicated to them in a similar manner to that of the machine already described.

The invention of the dressing machine forms a new era in the history of our subject. When it was applied to the power loom, weaving by machinery became gradually more and more successful, but neither the dressing machine, nor the loom, were brought at once into their present state. They gradually underwent modifications and improvements; changes were made in them without number, and now the two machines have been brought into such a state of perfection, that warps of 100 hanks per lb. are dressed and woven by power through reeds so fine as 1800, and with wefts of 100 to 120. There seems, however, not to be a very clear understanding in the trade, that the process of dressing should be carried on in such a manner as to strengthen and save the yarn during its performance, and keeping this object in view, to arrange means to produce the utmost possible quantity. The yarn with this view, should be placed in a position, so as to sustain the least strain in the action of dressing. The best position for this purpose is to place it in a horizontal line in the machine. The arrangement, however, in the engraving, although it is very objectionable on account of the increased strain on the yarn, is very common, and is adopted only for supposed convenience. The next consideration is, that those moving parts that come into contact with the yarn must be smooth in their action. The most important of this kind in the machine is the brush. It should be perfectly steady in sweeping over the yarn, that there may be no breakage from harshness of action. This motion in all the machines is more or less objectionable. As the yarn comes from under the action of the brush wet, and therefore very weak, nothing should be suffered to come in contact with it that can be avoided. In the most of dressing machines, as well as in the engraving before us, the rods for the lease are placed in this part of the yarn, and therefore ruffle and weaken it by unnecessary friction. This is bad arrangement, and may be easily avoided.

The dressing machine is attended by one man, and at present dresses yarn for about twenty looms. The number of looms, however, that the machine may supply, depends a good deal on the kind of goods made. In the weaving of silk, the preparation of the yarn is merely that of picking it off the knots, and spreading over it a small quantity of thin glue. The dressing machine therefore, in this manufacture, is useless, as well as in the woollen. In the linen manufacture, however, where dressing is necessary, the machine may be used as advantageously as in the cotton.

Sizing is another method of preparing the yarn for the loom without the machine. It consists merely in *hardening* the yarn by boiling it in starch, which is paste very much diluted. Various methods have been patented for accomplishing this purpose; but the following may be given as a general outline of the process: The yarn is passed through a trough of boiling size, and is led between squeezing rollers situated in the liquor, by which means it becomes thoroughly saturated. On emerging from the sizing vat, the yarn passes between another pair of rollers, and falls into tin receptacles, from which it proceeds on to the drying machine. The drying machine consists of an extensive series of metal cylinders placed horizontally, heated to a very high degree of temperature by means of steam, and revolving with a regular motion. The yarn is introduced at one end of the series, and winds round about from one cylinder to another, until it is delivered at the opposite end in a perfectly dry condition. One machine will size yarn for about 1000 looms. Sizing is preferable to dressing for all yarns under No. 40, and will doubtless ultimately supersede that process with the coarser numbers. It possesses the following very important advantages, which will not be slow in recommending themselves to every practical person. It has been found by experience in some extensive factories, that sized warps are much less liable to breakage during the process of weaving than dressed ones, and consequently produce a superior cloth. It has also been found, that each loom produces a larger quantity of cloth with sized than with dressed warps, a result which, it is very natural to suppose, would arise from the less frequent breaking of the yarn. The process of sizing, however, has not yet been rendered available for fine numbers; for these, therefore, whether of cotton or linen, dressing must still be resorted to.

The power loom has been very partially applied to either the linen, silk, or woollen manufactures; and with far less success than the means are capable of yielding. To employ it successfully in the weaving of these fabrics, requires a very intimate knowledge of the subject, and more mechanical ingenuity and command of means, than is readily found in one person. Much of what has been done in this department, has been the result of experimenting with very little knowledge, and this expensive and uncertain course of proceeding has probably, by reaction, repressed the introduction of improvement.

In the weaving of sailcloth, to which the loom was early applied, it had no success. The great difficulty in weaving this kind of cloth, is to get on the weft, and this difficulty was endeavoured to be overcome by increasing the *speed* of the lathe in striking home the shot. Mere speed, however, would produce a shaking and insufficient action on such fabrics. What was wanted was *weight* in the lathe, which should be exceedingly heavy and strong. The general fault of the power loom is, that the lathe, and indeed, the whole loom is too light for the heavy fabrics. The pacing of the web, too, should be carefully attended to. Much of the beauty of the work depends on sufficient pacing. It gives a firmness and fullness to the look of the cloth, which it never loses. In weaving very heavy goods, either of cotton or linen, and the rule holds in light goods as well, the pacing should be carried as far as not to injure the yarn, and thereby produce breakage. The framing of the loom should therefore be sufficiently strong, and the lathe so heavy, as not to be in the slightest degree disturbed by the stroke on the fell. The stroke should be a dead one; given when there is no opening in the shed. The shed should be opened smoothly, and the proper time for opening it is just when the lathe strikes the fell. There is a slackening of the web produced by the stroke, which, when taken advantage of in the opening of the shed, greatly diminishes the strain both on the yarn and heddles. There is nothing peculiar in the weaving of silk; it is indeed easier to manage than cotton or linen. The chief thing in weaving it, is to prevent the purling of the selvage, from the facility with which the weft shot comes off the bobbin, and this can be as well prevented in weaving by power as by hand. But as the mere saving in workmanship by the power loom, is but a trifle on the yard of silk, and therefore would not greatly increase the consumption by the diminution of the cost, and as it would require an increase of capital to carry it on, and a total change of all manufacturing arrangements, it may be long before machinery is extensively used here. The power loom is making its way into the woollen manufacture but slowly. In the weaving of woollen cloth, from the springiness of the material, the stroke should not be so sharp as in cotton weaving; and in the weaving of flannel especially, the shot should be sent home with pressure rather than with a stroke; and this is the principal adaptation that is made in the power loom for woollen goods. The number of power looms at present in use in Great Britain is about 130,000, and of the hand looms, 260,000. The linens and silks, with very little exception, and most of the woollens, are wrought by hand; and in the cotton department all the checks and muslins, and almost all the fancy work. As there is more mechanical knowledge and enterprise in the cotton trade than in any other, this manufacture will be the first to be brought wholly under the influence of machinery. Attempts have been frequently made to work checks by power, but they have failed, partly by the complexity of the means for working the boxes, but chiefly by the mischief attending the interruption of the box in rising or falling by the driver or picker. When this interruption happens, something must give way, and that is the box, which is probably broken in pieces. The means for taking back the driver or picker was defective. There was for this purpose a long spring attached to the driver by a cord, and this spring, besides exerting its utmost where it was not wanted, was liable, by the sudden jerk in picking, to snap at the driver, and then the breakage was inevitable. In the improved check loom there is no spring used here. There is a light lever, of the strength of strong wire, movable on a stud fixed near the rocking tree below the web. The one end of this lever reaches up to the driver, and is attached to it; and the other end, or arm, which is a short one, extends to the picking treadle, and a little under it. When, therefore, this treadle descends, it pushes this end of the lever down before it, and the other end attached to the driver is carried to the end of the spindle over the way of the drop box. This mischief therefore, is very simply prevented; and as there is no incumbrance here in picking, the speed of the loom in working checks need scarcely be reduced. On common power-loom fabrics, 100 to 120 shots per minute may be wrought with all safety.

Fancy weaving is another very extensive and distinct branch; and is almost wholly wrought by hand. It consists of the interlacing of the warp and the weft, in such a way as to produce a flower, or figure. This figure can only be produced in weaving by two ways; by relieving the warp from the weft, and by contrasting colours and shading. Contrasting and shading can be carried to any extent in weaving; but relieving can be done only to the extent of the thickness of the thread. The weft may be thrown almost altogether on the one side, and the warp nearly altogether on the other. This is done by tweeling, and this kind of weaving is, properly speaking, the ground of fancy work The shed of plain weaving is always one thread up and one down all over; but this is never the shed in tweeling. There are either two threads up, and two down, which is the nearest to plain work, and which is the common calico tweel for printed goods, or one thread out of 4, 5, 6, 7, 8, 9, 10, or any other number up, and the rest down, That is to say, supposing the shed were to be one out of every 8 threads raised, this, which is called a satin tweel, would be wrought by a set of heddles of 8 leaves, and with 8 treadles. Seven-eighths therefore of the warp would be on the one side, and seven-eighths of the weft on the other. If the warp and the weft were contrasting colours, black, and white, the under side of the cloth might be of the colour of the warp, white, and the upper side black. If the weaver then had some means for raising a certain portion of the warp, so as to throw the white on the upper side, the portion raised might be so arranged as to form a pattern on the black ground, and this is really damask weaving; the principle on which table cloths are wrought. In this case, where the warp and the weft are of different colours, the pattern is formed by contrasting and relieving. There are therefore two sheds produced here. The one for working the ground or tweel, by the heddles, and the other for forming the pattern, which is done by the harness. The harness is exclusively used for forming the pattern, and is an ingenious arrangement of cords for this purpose, whereby a very great assemblage of heddles, which would be necessary for even a small pattern, is dispensed with; and the largest and most complicated figure, which could not be worked from heddles at all, is wrought with ease. When this beautiful and ingenious invention was originated is not known, but it has undergone very great improvement since the quickening and extension of the trade by machinery. The harness is so arranged on a framing called the carriage, that an assistant, usually a little boy, standing at the side of the loom, can draw the cords and thereby raise the yarn. This could be accomplished, it is apparent, by attaching cords to the yarn, and placing a pulley case on the carriage, to change the direction of the cords to where the boy stands, at the side of the loom, and this is precisely what is done. The cords that come over the pulleys are called the tail, but as it would require another arrangement of a similar kind, to change the direction of the tail from the horizontal to the perpendicular, for the convenience of being drawn by the boy, and as this would greatly increase the tear and wear by friction, it is dispensed with by extending the tail 3 or 4 yards beyond the loom, and attaching to it perpendicular cords, so that when they are pulled, the tail is drawn down, and the yarn raised. The perpendicular cords are called the simple. The simple then represents the whole of the warp. But if there was one cord for each thread, the number of cords would be inconveniently great, and this is obviated by *classing* them at that part of the cordage that extends from the yarn to the tail. This part is called the *neck*. Each cord of the neck is attached to a copper eye, called the mail, to the under part of which, by a short cord, a piece of lead wire is hung. Through this eye the yarn is taken; and there is either one, two, three, or four threads, according to the kind of work intended to be made, taken through each. The number of mails will therefore vary according to the breadth and fineness of the shawl; but whatever is the number, 2, 3, 4, or 5000, there must be a cord for each mail. Above the mails the cords pass through the holy board. Its use is to keep the yarn, though drawn in the sloping direction of the pulley-box, in a perpendicular line, the holes are also bored in diagonal lines to prevent the yarn from standing in stripes. The board is then spaced off, and the cords divided into parts, and one neck cord from each part is taken and tied to one tail cord. The number of simple cords will then be reduced to the exact number of neck cords in the part, ten rows of which with five in each row gives fifty, the number which is called the tye. The harness then, after being tied, presents the mails ranged in a horizontal line for the reception of the yarn. The weaver draws the yarn through the harness, and the heddles, and then through the reed, and fastens it in front to the cloth beam. The next operation is the mounting of the heddles. For damasks, the work to which we are chiefly referring, the heddles consist usually of eight leaves, and the tweel a satin one, that is to say, one out of the eight leaves rises with an eighth part of the warp which is not raised at the time by the harness, and at the same time one sinks with an eighth part of the warp which is raised by it. This is accomplished by having a treadle to each leaf, and two cords attached to it from different leaves, one cord raising a leaf, the other sinking one alternately over the tweel. The heddles are suspended from levers, which are again counterbalanced by long levers attached to them by cords. The short levers or marches, as they are called, are interposed and attached to the heddles below to keep them firm and *sink* the shed. There is then one cord taken from the short march, and attached to the treadle for sinking the shed, and another from the long march to the same treadle, to raise it.

The next operation is to *read on* the flower intended to be woven. The pattern is first drawn on design paper, that is, a paper divided into a number of little squares of equal sizes, by lines crossing each other at right angles, which are in turn divided into larger squares called designs, each containing 8, 10, or more of the smaller spaces. Rows of the little squares may be considered as so many lines, those running from the bottom to the top of the pattern representing the warp, and those that run from side to side the weft. The perpendicular cords of the simple represent the whole warp, and therefore their number, and the lines in the breadth of the pattern, must be exactly the same. The paper is then placed in a frame, with the simple spread exactly to correspond with the lines in the design. There is a thin slip of wood, which presses the paper close to the simple, and guides the eye over the line in reading. This slip is placed in commencing to read at the foot of the pattern just above the first line, and the reading on of the pattern consists merely in taking up the cords of the simple that correspond to the coloured squares in the line across the paper, and inserting a cross thread to separate them from the rest. He then proceeds, running his eye from the right to the left of the pattern; saying mentally, take 9, and pass 10; take 6, and pass 2; and take 2 designs and 3. These simples are then lashed together 3, or 4, in a take, or *tak*. This forms the first line, then a second is taken in like manner, till the whole is transferred to the simple. The lashes are then strung alternately on two cords called the gut-cords.

When the weaver has got all this done, and the lathe on, the loom is mounted, and if he has got the yarn dressed, all is ready for work. He then sets himself on the front of the loom, with his feet immediately above the 8 treadles, and commences weaving by treading the first treadle with the right foot, which raises the shed, he moves the lathe back with his left hand, and seizes the picking pin to throw the shuttle with his right. The boy then draws the first lash, and the weaver throws the shuttle through the shed, and goes over the treadles working four, six, or eight shots according to the design, before the boy changes the lash. He has then wrought the little squares of the first line in the pattern. The boy then drops the cords, which are caused to fall quickly by the piece of lead wire suspended from each mail. He instantly raises the next lash, and this he does so quickly, that the weaver does not require to stop the process of shuttling. The harness shed here raises the warp in stripes; and if the weaver throw in the shuttle without raising the heddle shed, the shot would be floating from the one stripe to the other, wholly unattached to the warp. The heddle shed therefore, by raising one-eighth of the warp, and at the same time by the sinking leaf depressing one eighth part of that raised by the harness in succession, thus binds the whole together, but throwing the weft chiefly on the upper side of the web.

This is damask weaving; the principle on which table linen is wrought, and a great many shawls, chiefly for the foreign market. When the fabric is well made, it is both very durable and very pretty. Both of the sides of this kind of cloth may be said to be right. The figure is on the one tide, and its counterpart on the other Damask weaving, however, although forming the basis of all harness work, is in itself very defective in expression. It cannot portray a rich inflorescence. Whatever is the colour of the weft it is all incorporated more or less in the ground; it therefore suffuses colour, and from its defectiveness in shading and deepening, it can do little more than exhibit a bare outline.

This defect in shading is indeed inseparable from the principle of damask weaving, where the weft, whatever may be the number of colours used, is all interwoven with the warp. But if instead of this arrangement, we have two kinds of shots, one exclusively used for the spotting on the pattern, and the other for the ground, which is merely for the purpose of keeping the spotting shots in their places, we have the principle of full harness weaving, on which all rich and extensive patterns are wrought, and this principle gives us inexhaustible resources for pictorial effect. The ground in this case, therefore, is a kind of texture or net work, between the meshes of which the spotting shots are thrown in, to form the pattern; and in the interstices between the pattern where they are not needed for this purpose, they float on the surface of the cloth, and are cut off after the piece comes from the weaver. In weaving this sort of work, the weaver commences by throwing in a ground shot on the tweel, and when this is done the boy draws the lash for the spotting shot. This shot is then thrown, and the lash for the next spotting shot of another colour is raised and thrown in like manner, and so on for as many spotting shots as may be used in the pattern, when the weaver closes them all in with a ground shot. In this kind of weaving, therefore, the spotting shots, however numerous, add nothing to the length of the piece. They merely increase the thickness and colouring of the pattern; and hence the value of the shawl, as a piece of work, depends on the number of spotting shots between each ground one. Those spotting shots that are used continuously over the whole pattern, are called *covers;* but when used intermittingly, or partially, they are but parts of covers. As the weaver is paid so much per cover, and in proportion for a part, and as the material used is likewise in proportion to the number of covers, the manufacturer who is a severe economist, endeavours to give effect with as few covers as possible. This is always more or less evident in cheap shawls.

Certain parts of the pattern may have several covers, but these not being continuous, nor long wrought together, are but parts of covers; and though there may be many colours, there may be few covers. In some rich patterns there are as many as 10 or 12 covers, and of course as many shuttles besides the ground one, constantly used. But work so rich is not frequently made. The common stock of shawls in the shops runs from 4 to 6 covers. In this sort of weaving, where there is much changing of shuttles, the weaver, to enable him to do so easily, uses a shifting box lathe, in which there is a box for each shuttle. In these fine patterns on the full harness, where there is but one thread in the mail, each thread represents one of the small squares on the design paper, and there must therefore be a great number of simple cords, and a great many lashes for the large patterns so frequently met with in this style of work. This renders the mounting expensive; and the manufacturer endeavours with a less costly apparatus to imitate the full harness. He reduces, if not objectionable, the size of his pattern, and by increasing the number of threads in the mail to two, he diminishes both the number of simple cords and lashes. This is called the split harness, and brings us to the intermediate between the full harness and the damask, of which there are a great number known by different names, and distinguishable by some peculiarity in style, or manner of weaving. The split harness is woven with two shots on the lash, and although, in the outline of a curve, or the leaf-stalk of a flower, it will have rather a serrated uneven appearance, it is sufficiently fine for the Indian style of work, and indeed for the most of patterns which are made. The principal seats of this manufacture are Norwich, celebrated for the elegance of the style of its shawls, and Paisley, whose weavers are unequalled for a thorough knowledge of harness weaving; and Glasgow, on which Paisley chiefly depends; and Edinburgh, where some exceedingly good shawls are made: and Coventry, chiefly famous for the manufacture of ribbonds. Manchester likewise has a little of this trade, and several kinds of fancy goods are made in Dublin and the north of Ireland.

In our article Paisley, we noticed a peculiar kind of shawl called Cheneille manufactured at that place, and which for a considerable time was very much sought after, though now it has fallen considerably into disuse. For the invention of this beautiful kind of manufacture, we are indebted to Mr Alexander Buchanan of Paisley, the inventor of several other useful improvements.

These shawls, which have also been denominated Kamschatkas, derive their beauty and lustre from the peculiar mode of preparing the weft, and the ingenious manner in which the colours are afterwards arranged: in so much, that a pattern which would require a large harness as an imitation shawl, can be woven without any other apparatus than the ground mounting and two treadle feet. The weft, which is called Cheneille, is prepared as follows:—A Turkey gauze warp, of net yarn, is woven in a 1200 reed, with a twist or splitful in every fifth interval, the weft being either silk, cotton, or worsted, according to the kind of shawls to be manufactured. When this fabric comes from the loom, it is cut up by a machine, in the centre between the splitfuls of warp; and, after receiving a little twist, to throw the ends of the cut weft into a spiral direction, it is ready for the weaver. The warp of the shawl is likewise a Turkey gauze, the same as that which is the foundation of the weft; so that, when a sufficient quantity of Cheneille has been produced from a warp, it is customary to make shawls of the remainder.

In weaving these shawls, one shot of the Cheneille is thrown in, and three of common weft, whether silk, cotton, or worsted; and the fibres of the Cheneille, projecting in all directions, gives the fabric the appearance of a fine glossy shag, showing the pattern, when figured, alike on both sides.

When the shawls are to be of one uniform colour, only one kind of weft is necessary; but when they are to be figured, different colours are employed; and these are woven in spaces adapted to the different parts of the design. The pattern is first painted on design paper, and coloured as for an imitation harness. Each space of the design, or that which corresponds to a ground lash with its different covers, is again painted on a separate slip of design paper, but two spaces are here covered to make them better seen by the weaver, leaving a blank space on each side. These slips are all numbered to prevent confusion. Suppose, then, a web of trimmings were to be woven, with eight repeats in the breadth of a yard; for the first shot of Cheneille we take the slip of paper, No. 1, and find that, by reading it as for a simple, there are 2 spaces yellow, 1 white, 4 red, 2 yellow, 1 black, 2 white, &c. the weaver works a space of each of these colours on the warp, agreeably to its respective size on the slip of design paper; which, when finished, must be exactly the breadth of the trimming. For a guide to the weaver, the slip of paper passes through the reed, and is fastened at each end to a piece of tape by a bit of rosin, the one behind the mounting hanging over the warp roll and kept tight by a small weight, and the other fastened at the face of the cloth. The weaver then has only to change his shuttles by shifting the boxes of the lay at the end of each coloured space, as pointed out by the design. The slip marked No. 2 is next put into the reed for the second shot, and the colours woven in the same manner, but in the reverse order of the first, as the one is thrown in from the right hand and the other from the left; and so on till the weft for the whole pattern is finished. The weft is cut in lengths of eight yards, being the quantity usually wound on one pirn; and this will make eight shots of a yard wide web, and the pirns are taken in succession, agreeably to the numbers of the slips of design paper, and the colours are placed in the manner formerly done in setting the weft of clouding. This species of weaving is likewise well adapted to the rug and carpet manufacture.

The chief inconvenience in the weaving of shawls arises from the dependence of the weaver on the draw boy. He is wholly incapable of proceeding without him, and as much of his success depends on the ability and management of the boy, he is frequently a source of great uneasiness to the weaver. An invention, therefore, to enable him to draw the harness shed by the process of weaving, and thereby dispense with the boy, was much wanted, and eagerly sought after. Various methods for this purpose were invented and tried by the trade, but were attended with little success, till the introduction of the French, or Jacquard loom. This invention was originated, and made by M. Jacquard, of Lyons, in 1800, and forms a new era in harness weaving. It is one of those beautiful imbodyings of mechanical conception that result from a full and comprehensive view of the subject, by a master in design. Notwithstanding its great value to the weaver, the inventor of this beautiful and simple machine was more than once exposed to assassination, in consequence of the prejudice of the workmen against his machine. Three attempts were made upon his life—he was obliged for years to hide himself from the vengeance of the labouring population, and his machine was broken up in the public place, by order, and in the presence of the authorities appointed to watch over the trade of Lyons. The ignorance and prejudice which caused the silk weavers to destroy a means of assistance to their labours, capable of being made a great source of benefit to themselves, was not dispelled till the French began to feel the effects of foreign competition in their silk manufacture. They were then forced to adopt the Jacquard loom, which led to great improvement in their silk weaving, and at the present time above ten thousand looms are at work in Lyons. M. Jacquard not only lived to see himself reinstated in the affections of his citizens, but was pensioned to the extent of one thousand crowns yearly, and became the pride and boast of the operative classes.

The progress of the introduction of the machine into this country was very slow at first, from the same prejudices which operated against it in France, but it is now extensively adopted in all the manufacturing districts of England for weaving the fabrics to which it is suited. In Dunfermline in Scotland, a place long celebrated for its manufacture of damask table-linen, the machine was introduced about the year 1825, and so well was it found to be suited for that sort of fabrics, that there is not one of its 2000 harness looms unsupplied with a machine, and for weaving very wide table cloths, many have two, three, and a few have four machines on one loom. In Glasgow and its vicinity, they are also increasing very rapidly, the great reduction in price of the machines, which are now manufactured at less than a third of what they were originally charged, having given a wonderful stimulus to their introduction into general use; so much so, that in a few years they will entirely supersede the draw-boy in the manufacture of goods of ordinary sized patterns. In the larger flowers for shawls, so many colours are employed, that the price of the cards necessary to produce the pattern may for some time retard the introduction of the machine into that branch of the manufacture; consequently we find that in Paisley where the richer fabrics are the staple trade, its use has not been extensively adopted.

The inventors of all the plans that were previously tried to supersede the boy, endeavoured to adapt their contrivances to the loom just as they found it, with all the details fitting it for manual operation. It could not, therefore, be otherwise than complicated and expensive, circumscribed and limited in its application. M. Jacquard, in full mastery of his subject, swept away all the details that were added merely to enable the boy to act upon the harness, that is, the lashes, the simple, the tail, and the pulley box. What he wanted was to raise any given number of the neck cords, by the weaver's treadle, with the least possible inconvenience in weaving, and we shall see how well he accomplishes his object. On the top of the loom above the harness, is fixed a framing, having at its under part a board pierced with eight rows of holes, fifty-one in a row. Through these holes, attached to eyes on the ends of an equal number of perpendicular hooks short cords descend, to which are tied the whole neck cords of the harness, the eyes of the hooks resting on the holes, and supporting the whole. The hooks pass upward through eyes in as many needles placed in eight horizontal rows one above another, the eyes allowing the hooks a small backward and forward motion, sufficient to permit them, when necessary, to be pushed back out of the way of the lifting bars. One end of each needle is caused to protrude through the side of the frame by a spiral spring, on which its other end rests, consequently carrying the hook with which it is connected in that direction. Above this is a movable frame, in which are placed horizontally, and at right angles to the needles, eight flat iron bars, corresponding with the eight rows of hooks, which are slightly pressed against the bars by means of the springs acting on the horizontal needles, the curved part of the hooks being just above the bar ready to be lifted by it when the frame is raised. The flat sides of these bars are made to incline a little out of the perpendicular toward the hooks, those which are to be raised being thereby caught with more certainty by the bars on their ascent, and when the frame descends, the tops of those hooks which were not raised are pushed back by coming into contact with the inclined side of the bars, and by this means getting into their original position above them, in readiness to be lifted if required. It will be thus perceived, that as each hook passes through an eye in one of the horizontal needles, that if any of their protruded ends were pushed back, the hook connected with each would be carried along with it out of the way of the bar, and if the lifting frame was now raised, none of those pushed back would be taken up by it. In order to raise any required number of those hooks with the cords and warp attached to them, the following apparatus is employed: a four-sided roller or barrel is suspended in a swinging frame, exactly opposite the ends of the needles, and having each of its four sides perforated with holes answering to them in number and position, and into the perforations in which their ends would enter if the roller was applied to them, thereby allowing the hooks in connection with them to remain unmoved. An endless band of cards is made to revolve over this roller, each being exactly equal in size to one of its sides. These cards are pierced with holes opposite the needles connected with the hooks wanted to be raised, and when the roller with the card on its face is pressed to their ends, they pass through the holes in the card into the perforations in the roller, and are raised on the elevation of the frame carrying the lifting bars; the rest of the needles being prevented by the card from entering the roller, are pushed back, carrying the hooks out of the way of the bars. The next motion of the treadle by the weaver causes a quarter of a revolution of the roller, and presents another card to the ends of the needles, and so on, until all the cards have revolved, which completes the pattern; and which goes on to be repeated by the further working of the loom. The various motions of the machine are all produced by the action of the weaver's foot on one treadle, which communicates with levers connected to its moving parts, causing a vibratory and rotatory motion of the roller, a revolving of the cards, and the raising of the movable frame with the lifting bars.

Since the introduction of the Jacquard loom into this country, considerable improvements have been made upon it. The following description of improvements by Mr Jennings, along with the accompanying engravings, we extract from the "Transactions of the Society of Arts, Manufactures and Commerce."

Mr Jennings' improvements consist, first, in a method of reducing the height of the French loom, which, in its original state, is eleven or twelve feet, to about eight feet, and thus enabling it to be put up without inconvenience in the low rooms occupied by the weavers in Spitalfields; and secondly, in a new and far superior method of lifting the cords of the harness, and thus materially diminishing their friction on one another and the labour of the weaver. Both these improvements are the subject of Plate XCII., of which fig. 10 represents the former, and figs. 1 to 9, inclusive, the latter.

Fig. 10 is a back view of the frame *a a* of a French loom, to show the means by which it may be lowered to act under an ordinary ceiling. For this purpose the swinging frame, which required to be suspended so much above the frame *a*, is removed, and the revolving bar *n* is carried by two horizontally sliding bars *y*, one at each end. These are made to slide out and in by inclined metal straps *w w* on the vertical sliding bars *s s* while they raise and lower the lifting frame *d d*. *t t* are levers which, being connected with the treadle, lift the bars *s s*. The inclined bar or strap *w w* passes between friction rollers on the sliding bar *y*. The revolving bar *n* must be carried out enough for its corners, while revolving, to clear the pins *f f*; but this alone would not be enough to make it revolve, and to give it enough would require the straps *w w* to be much more inclined, which would increase the friction and make it hard to raise; therefore the retaining hook 5 6 is mounted on another bar, which is suspended from a pin 7, while its lower and inclined end 8 passes between two pins *g g* on the bar *s*, so that, when the bar *s* rises, the square bar *n* is carried out enough to clear the pins *f f*, and the retaining hook 5 is drawn inwards, and pulls the stud 2 sufficiently in to cause a quarter turn. A ⊔-shaped slide 10 10 is mounted on the bar *y*, and urged against the bar *n* by the spring 11: this makes the bar present the face with the card on correctly to the wires: the retaining hook 5 is double, and kept upwards by a small preponderance of the weight 6, but, if pulled down, the under hook catches the pins, and will cause a return of the bar *n* if required. 12 12 is a wire sling in which the cards 13 pack themselves and keep sliding down on the near side, while they are continually in the act of being drawn from the farther side over the rollers 14, 15, 16. The cards, as they return over the rollers 18 and 19, are drawn down by the weight of the portion 17, which, in the real machine, instead of only three cards, as shown in the plate, consists of a sufficient number to overbalance the preceding ones.

Fig. 1 is a side view of the new method of lifting the cords of the harness, and fig. 2 a front view; fig. 3 a part of the side opposite to fig. 1. *a a a a* the frame; *b b b b* the 4080 or more cords to be lifted in varying alternation; they are all supported by the board *c c*, through which they pass, and are tied in knots at top to prevent their return or dropping through: they next pass through the perforated board *d d;* this is the lifting board, and slides up and down in the frame *a a*, therefore all the cords have, just above the board, knots *e e*, fig. 3, by which they are lifted; they then pass through the eyes of the sliding wires *f f*, fig. 2, and, lastly, through the perforated board *g g*, and then are tied at *h i* to the 4080 strings *j j*, which pass through the compass board *k k* to the silk: they are tied in what is called the Norwich tie; each cord lifts ten of the strings *j j*, the front cord at *h*, fig. 2, lifting the ten front strings *l l l*, that at *i* the ten front strings *m m m*, and the six intermediate cords the six intermediate threads between *l* and *m* of the ten sets. In fig. 1 each line *b* represents eight cords, but, in fig. 2, each of the lines *b* represents fifty-one; and between *j j*, fig. 1, are fifty-one strings, each representing eighty strings, so that there are fifty-one clear layers of eighty strings each descending to the compass board *k:* these all can rise or fall without any sensible rubbing against each other. The sliding wires *f f* have no springs to protrude them, the weight on the cords *b b* being made to do it: for this purpose the holes through the boards *c* and *g* are made forwarder towards the revolving bar *n* than the corresponding eyes of the wires *f f*, so that the pressure of the weights on these cords tending to draw them straight, protrudes the wires: and the better to regulate the force with which they shall be protruded, the boards *c* and *g* are made to slide in the frame *a a* in order to adjust it. The varied perforations in the endless band of cards, a portion of which, from 4 to 13, is shown, being brought in succession by the revolving bar *n* and pressed against the end of the wires *f f*, determines which of the cords *b* shall be pushed in and which left out: the cords *b b*, while their wires *f* are not thrust in, pass through slits in the board *d d*, which are too narrow to let the knots pass; therefore those cords are lifted, but the slits terminate in round holes, shown in fig. 4, through which the knots can freely pass (some of them are shown in figs. 6 and 7 enlarged. When the wires are thrust in, they bring the knots on the corresponding cords over the holes, so that the board *d* can go up without lifting them; but as lifting this board also removes the revolving bar *n* which kept them back, those cords can again fall into the slits when above the knots; therefore, to prevent the knots catching on the under-side of the slits while the board descends, the round hole is elongated or sloped on the under-side as far as the slit, as shown at *o* in the section fig. 7, by which all catching is prevented, and the board passes the knot freely. Figs. 6 and 7 also show the conical recesses or chamfers over the slit in which the knots that are to be raised always fall, and are retained from any possibility of slipping out or off. Figs. 4 and 5 show the metal corners *p p* of the lifting-board *d;* the recesses in the four posts of the frame *a a a a* in which they slide are also faced with metal. This board, when down, rests on the two cross bars *q q* of the frame; they are faced with leather, and the under part of the two ends of the board *d* are also faced with leather at *r r* to soften the drop. *s s* two links by which the board *d* is lifted; *t t* the forked lever which lifts it; *u u* the bolt or fulcrum on which the lever turns; and on the other end of the frame is a hole *u*, through which the bolt may be put to remove the lever *t* to that end, if its situation so requires: *v v* the bolt which connects the links to the lifting board and carries the roller *w*, which, as it ascends and descends in the bent iron strap *x*, alternately pushes out and brings in close the frame *y y*, which carries the revolving bar *n n*. *z z* the screw centres on which the frame *y* hangs; by these the revolving bar *n* is adjusted longitudinally, to coincide with the ends of the sliding wires *f f*. At the bottom of the frame *y y* are two screws by which the height of the bar is accurately adjusted. Fig. 8 is an inside view, showing the adjusting piece which receives one of the pivots of the bar *n*. 1, 2, 3, 4, the corner pins by which the bar is caused to revolve as usual; 5, 6, the hook which always retains the outer pin while the bar goes out, and causes a quarter turn each time: this brings the next card in succession to meet the sliding wires. 7 a bottom hook tied to the upper one, so that, when the hook 5 is raised by pulling the string attached to its tail 6, it raises the hook 7 into contact with the pins: by this action the bar *n* may be made to revolve back again the other way, if such a return is wanted. 8 8 two slides shaped like an inverted ⊥; these are urged down by the springs 9 9 on the revolving bar *n*, and firmly retain it so as to present the face accurately to the wires.

Fig. 3 shows part of the longitudinal wires 10 10, on and between which the wires *f* slide; 11 11 11 vertical wires which pass through the loops, and limit the motion of the wires *f f*. Fig. 9 shows two of the sliding wires *f f* supported by the wire 10 10.

Thus, the action of one treadle connected with the lever *t*, both lifts the cords *b*, pushes out the bar *n*, and gives it a quarter turn, which presents the next face with the next card on it to be pressed against the ends of the wires, the blanks pushing in the wires opposed to them, which prevent those cords from being lifted, the weaver having nothing more to do with that operation than merely to move the treadle and throw the shuttle.

But perhaps the greatest improvement upon the Jacquard loom has been made by Mr Morrison of Paisley, in his adaptation of the machine to the harness work of that town.

Tweeled patterns, in the India imitation shawls, give the fabric a finer appearance and texture, and bring out the colours more brilliantly than without the tweel, but the harness to effect that purpose must be made upon a most extensive scale, and is of course very expensive. Mr Morrison saves much of this expense by means of a very simple but ingenious piece of mechanism, which tweels with the greatest ease, and is only one half the size of the original Jacquard machine.

Mr Morrison has also introduced another improvement of very great importance, to understand which it is necessary to mention that in a great proportion of the shawls manufactured in Paisley, the *lashes* are almost always twice drawn. Thus, a pattern of six covers, if the lashes are twice drawn, require twelve cards, that is to say, the second six cards, would be cut exactly the same as the first six. By this improvement only one set of cards is required, the machine causing a return of the same cards, to be wrought over again, as readily as a draw boy could repeat, by again raising the same lashes.

To accomplish this, a fast and loose pulley is placed on one end of the revolving barrel or roller, a sufficient portion of which is turned down to receive the pulley and allow it a small lateral motion. On one side of the pulley, is a projecting stud or catch which may be pushed into holes in the end of the square part of the barrel, by means of a lever and guide: and to the groove of the pulley is attached a cord having a piece of lead at its end, of sufficient weight to cause the barrel to revolve if permitted. Thus, when the catch on the pulley is pushed into one of the holes in the barrel, the pulley will revolve along with it by the process of weaving, and wind up the weight, and if the retaining hooks and *hammer* be now withdrawn, the weight will unwind the cord from the pulley and cause the return of the barrel in the opposite direction, and consequently bring the cards along with it into their original position. By disengaging the pulley from the barrel it remains at rest, until another repetition is necessary. Suppose it were required to repeat six cards; the weaver would first engage the pulley to the barrel, and after having wrought the six cards, he would by withdrawing the hooks and hammer from the barrel allow the leaden weight to act and cause the barrel to revolve backward until the cord was unwound from the pulley, and the cards thereby brought back to their original position ready to be wrought over again. He would then disengage the pulley from the barrel and proceed with the work until another repetition was required, when the same process would be repeated, and the cards returned with the precision of clock work. This improvement is well suited for various kinds of work, particularly for damask sprigs, the plain between which, frequently requiring as many as five hundred cards, whilst by this method eight only would be needed.

By these improvements it will be perceived, that Mr Morrison has doubled the power of the Jacquard machine in two different departments, and may be said to have perfected it for the fancy weaving of Paisley. His machine is patented.

The card punching machine is provided with the same number of horizontal needles as the Jacquard machine, and to each needle is attached a small cord, on pulling which the needles protrude through perforations exactly corresponding to those in the revolving barrel or roller of that machine. Pieces of leaden wire are also suspended from the needles by cords passing over pulleys to bring them back into their former position after being protruded. In front of the perforations through which the needles pass, is placed a thick plate, similarly perforated, having a movable steel punch placed in each hole, and before this is placed another similarly perforated plate into which the punches contained in the thick plate may be pushed by the needles when the lifting cords, attached to them, are pulled. This plate is not fixed, but can be removed along with the punches that may have been deposited therein. A steel plate pierced with holes, corresponding to the holes in the other plates, is fixed on a carriage; upon this plate the card to be pierced is laid ; above it is put the plate containing the punches, whose ends rise a little above the surface of the plate, and the carriage is moved under a revolving drum, or rolling press, which forces the punches through the card into the perforations in the plate beneath. The plate with the punches is now returned to its original position in front of the needles, and the punches are pushed back by an instrument that enters into every hole in the plate, it is then ready for another set of punches.

In order to perforate the cards so as to produce the desired pattern, it is first drawn of a large size on design paper, and placed in the hands of the card cutter. He places this paper before him on a frame, which is provided with vertical threads, or simple cords answering to a portion of the warp equal to the width of the design. The threads are extended over a sort of comb, having its teeth corresponding with the small squares on the design paper, on which the pattern is drawn, and leaving an empty tooth opposite every heavy line on the paper, in order to facilitate the *reading on.* He then commencing at the undermost row and proceeding in regular succession to the top, inserts cross threads under all the perpendicular threads indicated by the colours in the pattern, leaving the end of each thread to extend a good way beyond the salvages on each side. The perpendicular threads thus interlaced are then transferred to the card punching machine, the uppermost end is turned down, and each thread is attached by the end next the last inserted cross thread, in their regular order, to the lifting cords of the machine. Beginning at the undermost, the cross thread corresponding to the top row of the design is withdrawn, and an iron rod is inserted in its place. The rod is now placed in connection with a crank moved by a treadle, on pressing down which, the rod is pushed back, causing the lifting cords over it to protrude their corresponding needles and push the punches opposite their ends out of the thick plate where they were deposited into the movable one. This plate with the punches in it is taken to the rolling press, the card, pierced as already described, and the plate and punches returned to the machine; the rod is inserted in the place of the second cross thread and treated as before, and so on until cards for all the rows in the design have been perforated. The large holes in the ends of the cards into which the adjusting conical studs on the revolving roller enter, and the two holes on each edge for attaching them to one another, are made at the same time with the others, punches for piercing them remaining permanently in the movable plate. The cards having been numbered before their perforation, are laced together by cords in their order, and are then ready for the weaver. Another card cutting machine has lately been invented, called the piano machine, in using which the card cutter reads from the design, and punches the cords at the same time, without the necessity of interlacing the pattern in the simple as formerly described. This machine has in a good measure superseded the other in the cutting of cards for small patterns, where few cards only are required.

In heavy pattern weaving, where a considerable force is necessary to raise the harness shed, the fatigue to the weaver is more than he can stand, and go through with his work. The benefit, therefore, of this invention, and indeed, of all invention for manual labour, is limited by the strength to use it. But the jacquard loom is not necessarily restricted to manual labour; it is to the harness loom, what the invention of the fly shuttle is to the hand loom—a great step made in the combination of its motion, so as to fit it for being brought under the influence of machinery. The weaving of harness loom by power, is not so difficult as might be expected from the complexity of the parts. In the first place, the yarn of such fabrics is sufficiently strong to stand the action of the common power loom; and the means, therefore, so far, are already provided. The application of the Jacquard principle to the power loom, is no great difficulty. It is true the communication by cords is quite inadmissible by power, but this arrangement is easily altered; and its adaptation for the purpose comes within the sphere of common mechanism. All that a good mechanic wants, is the principle of the invention to be adopted; and here it is quite suitable for the purpose. The capability of the power loom, indeed, has been partially tested in the weaving of damasks, at Glasgow, and elsewhere. In table-linen weaving, and strong work that requires only one shuttle, and where there is not much harness shedding, the attendance on the loom is not great; and therefore one person may manage two looms, and with such work it can hardly fail of being profitable; but in the finer descriptions of goods, where there is much shading, and changing of sheds, and several shuttles used, one person will be required to each loom, and here the profit will not, perhaps, be so great. But if there were no other advantages attending the change, than the economizing of the material resulting from a concentration of purpose, and the control over the production by the manufacturer, it would be a sufficient inducement to do away with the old system of hand labour. The means, it is obvious for producing this change, are in the course of progression, and the time may be said to be within view, when the whole of the manufacture for supplying the people with clothing, will be accomplished by machinery. The inseparable benefits resulting from this change are not merely a greatly increased production at a diminished cost, but by rendering machines the labourers of society, we raise our artizans in the scale of civilization, and make them the directors of an agency that toils for the good of all.

WEST INDIES, (*a.*) In the article *West Indies* in the body of the work, (see also the article *Slavery,*) we promised to give, in the Supplement, some account of the effects of the abolition of slavery there. Sufficient time has not yet elapsed to develope completely all the results that may arise from this great measure, but it is gratifying to know, that, on the whole, the change has been accompanied with less confusion than might have been anticipated, and every month brings an increase of favourable tidings regarding the working of freedom.

On the immediate emancipation of the negroes, one main cause of difference between them and their employers was the rents exacted from them for their houses and provision grounds. The third clause of the apprenticeship abolition law gave the free labourers the use of their houses and grounds for three months; that is, they could only be ejected after a three months' notice to quit, prescribed by the act. The planters, with few exceptions, seized on this as a means of obliging the labourers to work at low wages. Instead of endeavouring to conciliate the affection of these friendless beings, by allowing them to remain in their houses at a moderate rent, they immediately issued notices to quit, or demanded rents of so exorbitant an amount, that they often exceeded the entire wages which the negroes were offered for their labour. In many cases rent for house and grounds was charged for every individual in a family. In other cases, labour was agreed to be taken in commutation of rent; but this led to endless quarrels, for managers did not scruple to turn a family of labourers adrift in order to get rid of demands for wages incurred; and when the negroes complained, they were told to seek redress where they pleased. The disquietude arising from this cause lasted for six months at least after the day of liberation, and reacted most severely on the proprietors of the sugar plantations, for, while the quarrel existed, comparatively little was done to prepare the ground for the next crop of canes, and the produce, therefore, in 1839 was about a tenth less than formerly. Indeed the estates received such a shock in the end of 1838, and the beginning of 1839, that it is calculated that it will require three years to enable them to reach their former condition. This should be kept in mind by the friends of freedom, so that they may not be drawing unfavourable conclusions as to emancipation, if, for a year or two to come, the sugar crop should be deficient, and that article should consequently bear a high price.

At length the quarrel respecting rents and wages terminated, and the negroes diligently applied themselves to their work, which, in fact, they had been willing to perform, perhaps with some few exceptions, from the very first. But it was observed that fewer labourers wrought in the fields than formerly, and that they in general wrought only five days in the week. This excited many fears, and no little clamour. It was construed into a love of idleness in a portion of the population. Those who knew better, showed that it was simply a result of freedom; it was proved that the able-bodied man who was now free, in some instances did double his former amount of labour, the excess forming a provision for the weaker beings who depended on him for support. The following is magistrate Fishbourne's report on the subject:—"During slavery and apprenticeship, one-third of the people residing on estates were considered incapable of, and were exempted from, labour. Seventy out of one hundred slaves or apprentices was considered a fair proportion. Of those seventy, probably one-third was composed of the pregnant women, or mothers of large young families, the very old or very young, sickly or ulcerated individuals, and domestics, &c., who, if deducted, would leave about one-half of the gross strength of the estate, or about fifty effective labourers. The decrease, therefore, of the number of effective *field*-servants is not so large as those not acquainted with plantation economy might imagine, on being told that not above half the people on an estate now work in the fields."

On the other hand, the emancipation act effected a number of striking cures. A missionary writing from Jamaica says, "The old and infirm, who for many years did nothing, and were exempted from all labour, have suddenly become young and strong; the lame walk, and the blind see; sickness is all but fled from every estate; the hot-house, or estate's hospital, is a deserted mansion; the medicines, bottles, and parcels are all covered with dust, and the doctor on many estates absolutely discarded. Whole hosts of the sick, diseased, and lame have been suddenly restored; and the magic tinkle of an English shilling has wrought a cure more lasting and complete than was ever accomplished by the skill of the most learned and skilful doctor."

With regard to the question as to the comparative expense of free labour and compulsory labour, it would appear that the former will eventually turn out the cheapest of the two to the planter. Mr Grant, a stipendiary magistrate, enters into some calculations respecting the cost of cultivation on a property which had at one time 350 slaves. The expense of free labour which it required in five months was L.240, 14s. 4d., and for the same space of time, the expense of apprenticeship, or slave emergencies, would amount to L.725, leaving a balance in favour of the expense required for free labour of L.484, 5s. 8d.; "and the late deficiency law required five people, besides the overseer, doing militia duty, to be employed at salaries, and maintained on the property. The saving effected by the change in this particular is very great. The book-keepers are now dispensed with. The supercession of a free system has been a great relief to the owners of unproductive properties. They were bound to give the prescribed allowances to their slaves, without reference to their own profits. To illustrate this position, I can point out a property on which were settled 100 slaves. The lowest estimate of expenditure on their account is L.500 a year, and the possession, notwithstanding the high price of produce, has of late years regularly increased the owner's debt. Since 1st August to 31st December, the labour account has amounted to L.99, 4s. 2d. The usual cultivation has been carried on and improved; the pastures, hitherto neglected, are cleaned; and about thirty acres of coffee, which had grown up to the state best described by 'ruinate,' have been opened. The produce, small as it is, now secured, will pay all the expenses of the plantation, and, even in this first year of experiment, place the proprietor on a better footing than under a continuance of the previous system he ever could have hoped for."

In the report of Messrs Lyon, Dillon, and Kelly, March 1839, a similar evidence is afforded:—"With regard to the assertion that the sum paid for labour is so high as to render it impossible that the returns of sugar-planting can sustain it, it is only necessary to say that experience has proved that the expenditure varies from L.3, 10s. to L.5 per hogshead. The planter, therefore, has it in his power to compute his expenditure against his profits; and, with sugar selling in the colony at 40s. to 54s. per hundred-weight, and rum from 6s. 8d. to 8s. 4d. per gallon, it may, without difficulty, be shown that the result must be extremely favourable to him."

The following is from Mr E. D. Baynes, April 3, 1839:—"In the midst of so much misrepresentation, and so much real or affected despondency on the part of the planter, the confidence of the great majority of the other classes of the community in the stability and security of property, remains unabated. Land, especially in the vicinage of towns, has risen, and is increasing in value. Mr Duncan Hamilton, of Retreat, in the parish of St John, who, four years since, assured me that he did not think he could get L.3000 for his property, has, within these few weeks, disposed of it to Mr Alexander Reid Scott, a store-keeper of Kingston, for the sum of L.10,000."

Mr Ramsay, April 6, of the same year, says—"During slavery and the apprenticeship, the jobber charged from L.10 to L.12 per acre for digging, with his slaves, or apprentices, an acre of land into cane-holes; now, at wages of 1s. 8d. per day, an acre of cane-holes may be dug for the sum of L.2, 10s. currency; at 2s. 1d. wages it will cost L.3, 2s. 6d.; at 2s. 6d. wages, it will cost L.4, 10s.; and at 3s. 4d., the highest rate of wages that I have heard of, it will cost only L.5, just one half what it cost in times past. The whole estimated expense of each negro to the planter, was from L.6 to L.7 per annum."

Another communication from Mr Grant gives a very cheering view of the effects of emancipation. "The improvement," he says, "in the moral condition of the liberated labourers since the day of their final emancipation is greater than their most sanguine well-wishers could have anticipated. There has been only one person in the house of correction for some time, sentenced during apprenticeship. On scarcely a property is a watchman kept or required, and although coffee and other produce is openly exposed on barbicues or other places, a case of theft is exceedingly rare. The church and schools are crowded, and the greatest desire for religious and other instruction evinced by the entire population. The number of marriages and baptisms increase daily. There is a great change in the apparel of the mass of the peasantry, and in their general demeanour they are most respectful. The population, he concludes, "are industrious, and are progressing in morality and civilization."

One of the ordinary stages in the progress of civil society, is the formation of free villages and towns. This stage of civilization is now to be witnessed in various parts of the West Indies. The difficulties which have arisen in regard to the houses of the Negroes connected with estates;—the exorbitant rents which have been demanded by many of the White people, on the one hand, and the unreasonableness of many of the Negroes, on the other, in refusing to pay any rent whatever, and in resisting the processes of ejection, which have been served upon them, have, no doubt, hastened on measures of this description. We trust that the result will render the Negroes more independent of the White people, and thus show the latter the necessity of treating them with justice and moderation. They will lead to the cultivation of those extensive tracts of land, which have hitherto been totally unproductive, and will furnish the inhabitants with many of the necessaries of life for which they have hitherto been dependent on distant countries. They will give an impulse and an expansion to the mind of the Negroes, when they are engaged in the cultivation of property belonging to themselves, and will, probably, be a first step by which many of them will ultimately rise in the scale of intellectual and moral worth, and of worldly respectability and affluence.

WESTALL, Richard, an artist well known for his numerous illustrations of the elegant literature of the day, was born about the year 1766. In 1779 he became an apprentice to an engraver of heraldry in London, and in this humble department of the arts, he soon so far distinguished himself as to draw upon him the attention and patronage of several eminent connoisseurs. In 1786, he commenced his career as a painter. About this period, he formed a friendly intercourse with Mr, afterwards Sir Thomas, Lawrence, and they took jointly a house in Soho Square, where they lived for several years, until their success justified their forming separate establishments. There was no professional rivalry between them, as their walks in art were quite different, and the friendship formed in their youth was never broken but by death. Mr Westall acquired distinction by making finished pictures of historical and poetical subjects in water colours, a branch of art in which he attained to a brilliancy and vigour before unknown. His pictures of "Sappho in the Lesbian Shades," of "Tubal, the first voice of the Lyre," of "the Boar that killed Adonis brought to Venus," of "The Storm in Harvest," of "The Marriage Procession from the Shield of Achilles," and many others, were much admired. These were followed by a complete series of designs, made for Alderman Boydell, to illustrate the works of Milton, and also by illustrations for the Shakspeare Gallery and Bowyer's History of England. He also produced a multiplicity of designs for booksellers and publishers, and for more than thirty years was second, perhaps, only to Stothard in the abundance and popularity of his works in that line. In 1794, he was elected a Royal Academician, the same year in which Sir Thomas Lawrence and Stothard received that honour. In 1808, he published a volume of poems, in 8vo, with designs, entitled "A Day in Spring and other Poems.' The poems display evidence of an elegant and accomplished mind. By his professional exertions, he attained a handsome competence, which, unfortunately, was subsequently absorbed in an unsuccessful speculation in foreign pictures, and some unfortunate partnership engagements. He was secured, however, from indigence by the assistance which the Royal Academy bestows on its reduced members. One of his latest occupations was giving lessons in drawing and painting to her present majesty, then princess Victoria; and the distinguished progress which his royal pupil made in the art was a source of high gratification to him. Mr Westall died on the 4th December, 1836. At his death, a maiden sister, unfortunately blind, would have been left utterly destitute, but for the duchess of Kent, who beneficently settled on her an annual pension of £100. In person, Mr Westall was below the middle size, and of a slight and delicate form. His manners were retiring, but he was highly esteemed within the circle of his acquaintance.

WORMS. We take advantage of this head to introduce a few remarks regarding animalcules, which were inadvertently omitted under their proper head, *Infusoria*. See plate XXXII. and XCI; and article *Microscope*.

The Infusoria include all those minute animals, most of them invisible to the naked eye, which are found in infusions of vegetable and animal substances. Their history has always been dependent upon the powers of the microscope; and until of late years, since the instrument has been greatly improved both in power and delicacy, comparatively little was known regarding the Infusoria beyond the fact of their vitality; and even this was questioned by Buffon and others, who gravely asserted their opinion that they were nothing more than "active organic particles." Even Müller was unable to carry their history much farther than the fact of their actual vitality; for his optical resources lacked the power to discover their structure sufficiently to establish such analogy between them and higher creatures, as would allow them to take a definite position in zoology. The recent advances of optical science, and the indefatigable researches of Ehrenberg, have led to the discovery of many new and interesting facts regarding these minute creatures. It is now ascertained that they are related by strong analogies to the animal kingdom, though placed at the extreme descending limit of vital existences. An opinion was long entertained that they were merely masses of gelatine matter, vital indeed, but altogether nourished by absorption. This erroneous impression has been removed by the discovery of sacs or stomachs suited for the digestion of food, and mouths curiously contrived for securing and taking in the matter upon which they feed. They who are curious to learn minute particulars regarding the structure, functions, instincts, and singular habits of the Infusoria, would do well to consult Pritchard's "Natural History of Animalcules," in which the subject is lucidly treated and elaborately illustrated. Under the article *Microscope* we have been permitted to extract from this work, and to that article, in connection with the illustrative figures in plate XCI., we refer the reader for much interesting information. We need not in this place add more than the names of the several species of Infusoria figured in plate XXXII., but not referred to under *Microscope*, to which article the present one is to be deemed supplementary.

VOLVOX. *V. globator*, pl. XXXII., fig. 35.
ENCHELIS. *E. punctifera*, f. 30. *E. farcimen*, f. 41. *E. retrograda*, f. 45.
VIBRIO. *V. paxillifer*, f. 31. *V. vermiculus*, f. 36. *V. lineola*, f. 40. *V. lunula*, f. 44.
CERCARIA. *C. inquieta*, f. 29. *C. Turbo*, f. 43.
TRICHODA. *T. sol*, f. 37. *T. cometa*, f. 38. *T. vermicularis*, f. 46, 47. *T. farcimen*, f. 50. *T. bomba*, f. 53.
LEUCOPHRA. *L. cornuta*, f. 54.
VORTICELLA. *V. anastatica*, f. 28.
BRACHIONUS. *B. Bakeri*, f. 23.

WYATVILLE, SIR JEFFREY, R. A., F. R. S., F.S.A., a modern architect of some distinction, was the son of Joseph Wyatt, a builder at Burton-upon-Trent, in the county of Stafford, where he was born on the 3d August, 1766. He was educated in the free school of that town, and afterwards placed with an uncle, then an architect of repute in London, with whom he remained for seven years: subsequently he entered the office of another uncle, known as the builder of The Pantheon in Oxford Street. In 1799, he joined in partnership an eminent builder, who had extensive government contracts; and continued to pursue a profitable, though comparatively humble, career, until the year 1824, when he was called upon to attend and receive personal instructions from his majesty George IV. respecting designs for restoring Windsor castle. For this more important professional object, he relinquished his pursuits as a man of business. After a visit of the commissioners to Windsor, and a liberal grant of money, the general plan of operations was settled; and on the 12th of August, 1824, the anniversary of his majesty's birth day, the first stone was laid. On that occasion, the king conferred on the architect authority for changing his name from Wyatt to Wyatville, for the purpose of separating and distinguishing the Wyatt of that reign from Mr James Wyatt, who had been much identified with the architectural works at Windsor, during the life of George III. In December 1828, the king's private apartments were completed, and on his majesty's taking possession of the castle, he bestowed the honour of knighthood on his architect. Although Windsor castle is the prominent professional work of Sir Jeffrey, there are many other buildings, in different parts of the kingdom, which have been either wholly raised, or essentially improved, from his designs. There is scarcely a county in England, indeed, which cannot show some proof of his art. For the last five years of his life, he laboured under a disease of the chest, yet never abandoned his profession. So late as the close of 1839, he designed the stables at Windsor castle, and lodges for the Sheffield and Derby entrances to Chatworth. He died on the 18th February, 1840, and was buried at the back of the altar in St George's chapel, Windsor castle. As an architect, he was distinguished for sound judgment, and a strong faculty for arrangement under difficult circumstances.

THE END OF SUPPLEMENT.

ANALYTICAL INDEX.

INTRODUCTION.

THE POPULAR ENCYCLOPEDIA is in the hands of a large portion of the community whose books are few. With the exception of the Bible, and a few miscellaneous volumes, this Work perhaps forms the entire library of a very numerous class; and to it they naturally refer for information and knowledge on all subjects whatever. Without assuming an infallibility, which belongs neither to the present publication, nor to any other that has ever appeared, the proprietors venture to say, that no other book of similar compass has presented such various and complete information concerning all matters that are interesting and useful to the great mass of mankind. Its suitableness, in this respect, for the literary wants of those who are denied the privilege of many books, is apparent: and it was with the view of increasing its usefulness to this class of readers, that the Analytical Index was prepared.

An Encyclopedia, if constructed on legitimate principles, is, like any other dictionary, a book of occasional reference; it has indeed been made a ground of objection to encyclopedial publications, that they offer isolated modicums of information, and give that "little knowledge" which, according to the poet, "is a dangerous thing." The objection; however, loses all its weight if these detached items of knowledge are compiled with reference to one great whole;—if, in short, they form in the aggregate the sum and substance in all the grand divisions of Literature, Science, and Art. It is a mathematical axiom, that the sum of all the parts is equal to the whole: if, therefore, in the formation of an encyclopedia, the compiler be careful to omit no important details, it is merely necessary that we assort these details, and bring them into natural connection with each other, and the book then becomes not only an Universal Dictionary for ready reference, but also a methodical and satisfactory expositor, in all the departments of human knowledge. The Analytical Index which follows confers this twofold value on the present work.

An Analytical Index is very simple in theory, but presents many difficulties in the course of its construction. The same details which, taken collectively, form a methodic treatise on one subject, combine also with other details to make up a complete digest of various branches of knowledge; and amidst the items in any one branch, many will be found claiming a right to stand out prominently in connection with the minor particulars to which they relate. To explain: *Painting* necessarily requires amongst other details, that of *Colour* and its varieties; *Colour* claims also a separate place, having conjoined with it all the particulars which the term includes; *Chemistry* likewise takes cognizance of colour; and *Dyeing* would be incomplete if the articles on colour were not ranged in its analysis. Here then, is an instance in which one term, with many of its subordinates, must enter into four separate combinations. The result of this is, that to give full completeness to the Index, a very expensive and bulky appendage to the book is necessary; and to restrict the Index within moderate limits, involves the danger of omitting many secondary, yet important, generic terms. It remains for us to justify the plan we have adopted in the present case; to prove, so far as we may be able, that we have struck a fair balance between the two difficulties; and, in a few explanatory remarks, to show that the Analytical Index annexed is sufficiently adapted to the end in view.

The Index is divided into Six Sections, embracing all the great divisions of human knowledge.

SECTION I.

HISTORY AND GEOGRAPHY.

I.

HISTORY IN GENERAL.

FABULOUS HISTORY.
MYTHOLOGY.
ECCLESIASTICAL HISTORY.
[Biographies connected with Church History.—Greek Church.—Romish Church.]
CHRONOLOGY.
MISCELLANEOUS.

The particulars ranged under these several heads, make up a bold and general outline of history; and if the reader be sufficiently persevering to store his mind with these preliminary details, he will enter with great advantage upon the more extensive analysis in the Third Division of this Section.

II.

GEOGRAPHY IN GENERAL.

Oceans, Seas, &c.
Mountains.
Divisions of the Globe.
(Africa.
America.
Asia.
Australasia, or Oceania.
Europe.)
Miscellaneous.
Geographical Terms.
Geographers.

The grand outlines of Geography are here traced for the reader, by which he will be enabled to obtain a general knowledge of the science before entering upon the extensive details which immediately follow. With reference to these two Divisions, we make one remark,—that they are intended to take in generals only, and that, consequently, no disappointment should be felt if many things familiar to the reader be omitted here, and take a more definite place in Division III.

III.

GEOGRAPHY AND HISTORY IN RELATION TO PARTICULAR COUNTRIES.

The plan adopted in the arrangement of the complicated details which enter into this Division, the most important one in the Section on History and Geography, will, we believe, present singular advantages to the reader. The object has been to give in immediate connection with the different countries, their Geography, Topography, History and Biography; so that every thing bearing directly or indirectly on the *Geography* of a kingdom or province, and the *History* of its inhabitants, might be readily consulted. Throughout this Division there will be perceived consistency of plan, but not uniformity; the latter, it was neither possible nor desirable to observe. It was not possible to give so full an analysis of many countries as we were enabled to do of our own; and it would not have been desirable to encumber the Index with an equal severity of arrangement in all cases, since the value of extensive details is proportionate to the importance of a kingdom or state in itself, or in its relations to other nations of the globe. We only add with reference to this leading Section of the Index, that it brings into one view and into natural connection, a large amount of knowledge on the most important subjects that can engage the attention of social man; and should any hypercritical examiner discover omissions,—and we do not hesitate to tell him he *may* find omissions, for we have modesty enough to admit that an Encyclopedia in Seven Octavo Volumes, cannot state *everything* belonging to *everything*,—we would, in return, beg him to store his mind with the amount of truth here presented to him, and if he do this we venture to state our opinion,—which we may do without any hesitation,—that he will become a very sufficient Geographer and Historian.

SECTION II.

LAW, POLITY AND POLITICAL ECONOMY. ARMY AND NAVY.

I.

LAW.

Feudal System.
Courts of Law.
Law Officers, &c.
Legal Instruments.
Law Terms.
Crimes and Offences.
Punishments.
Eminent Lawyers And Writers on Law.

The First Division in this Section, the heads of which we have given above, includes as copious an analysis of *Law* as would be obtained from the most talented and methodical work exclusively devoted to the subject. The modes of ancient and modern judicature, the constitution of courts of law, and the varieties of crime and punishment, are exhibited in the most lucid manner; and much interesting matter connected with the general subject will be found incorporated with the biographies of Lawyers and Writers on Law.

II.

POLITY.

III.

POLITICAL ECONOMY.

These two Divisions do not assume a very important bearing in the present section; but for this there is an obvious and satisfactory reason. All matters regarding *Polity* and *Political Economy* will be found in connection with the *History* of the different kingdoms and states, in the first section; and it was considered perfectly unnecessary, and tending only to superfluous display, to gather extensive details under these Divisions.

IV.

ARMY AND NAVY.

This Division embraces under a number of subordinate heads a complete treatise on Military and Naval art, together with copious biographies of the most talented and distinguished warriors and navigators of all countries, as well as of the most eminent Writers on Military and Naval tactics.

SECTION III.

THE FINE ARTS.

This Section includes *Painting, Sculpture, Engraving, Heraldry*, and *Architecture;* together with *Music* and *Poetry.* With respect to these Divisions, we may observe, that the leading article of each is very full and satisfactory, and if in the copious details which range under it, there should seem to be an occasional omission, it will generally be found that this omission in the Index is supplied by the extensive and minute view of the subject embraced in the leading article itself. It could not be expected that all the minutiæ of art should have *separate* mention in the book, and this being the case, these minor features could not all be particularized in the Index. We may state, that the biographies in this section are peculiarly rich, and will afford much satisfaction to the student and admirer of Art.

SECTION IV.

GRAMMAR, METAPHYSICS, AND MATHEMATICS.

I.

GRAMMAR.

This Division embraces *Language, Hieroglyphics, Writing*, and *Typography, Grammar, Rhetoric, Logic*, and *Philology.* These several heads combine into one harmonious whole, and form a highly satisfactory compendium on one of the most interesting departments of human knowledge.

II.

METAPHYSICS.

Under this Division are included *Theology, Bible*, and *Metaphysics.* The details alphabetically arranged beneath these three heads take up the general subject very fully. The Biblical student and the metaphysical inquirer will derive great benefit from a perusal of the numerous articles and biographies collected in this Division.

III.

MATHEMATICS.

MATHEMATICS.
ARITHMETIC.
ALGEBRA.
GEOMETRY.
TRIGONOMETRY.

Although the details connected with the heads of this Division are not numerous, it will be found in reference to the articles, and more especially to the heads themselves, that the various branches of mathematical inquiry are extensively illustrated and their principles thoroughly defined. Under *Geometry* and *Trigonometry* will be found excellent elementary treatises on these two subjects.

SECTION V.

NATURAL PHILOSOPHY.

This Section embraces the following Divisions :-

I.

NATURAL PHILOSOPHY.

II.

NATURAL HISTORY.

PHYSIOLOGY.
ANIMAL KINGDOM.
VEGETABLE KINGDOM.
MINERAL KINGDOM.

III.

MEDICINE AND SURGERY.

IV.

SCIENCES.

GEOLOGY.
CHEMISTRY.
ELECTRICITY.
METEOROLOGY.
OPTICS.
ASTRONOMY.

The extensive and interesting departments of knowledge included in general under the term Natural Philosophy, are opened up in this Section very satisfactorily. The Division on *Natural History* has been found so complete in its details as to admit all the classification and arrangement usually observed in popular works exclusively devoted to the subject. The *Sciences* also, are equally rich in their details; so much so, that the chemical articles have been highly commended by Professor Gregory of Aberdeen: and the Supplemental treatise on the Microscope called forth a letter of approval to the Publishers, from Mr Pritchard of London, a gentleman standing in the first rank as a philosophical writer and a practical optician.

SECTION VI.

USEFUL AND MECHANICAL ARTS, MANNERS AND CUSTOMS AND MISCELLANEOUS.

This Section is altogether miscellaneous in its nature. The first Division embraces the principles of *Mechanics*, an alphabetical enumeration of the various *Arts and Inventions* formerly and at present existing amongst mankind, and an analytical view of several branches of mechanical art. In explanation of the apparent deficiency of analysis in this section, it may be sufficient to inform the reader that there will usually be found under every term in the list of Arts and Inventions, a very full account and explanation of the particular art to which it refers: and that consequently, no separate details occur in the work, to admit a formal analysis. The second Division, including *Manners* and *Customs*, presents a large amount of useful and interesting information concerning the domestic and social habits, the occupations, the national characteristics, &c. &c., of mankind, throughout all countries and in all ages of the world. The third Division takes in a few of those *Miscellaneous* subjects with which the Encyclopedia abounds: and the reason why this department of the Index has not been carried to greater extent is, simply, because no very important end would have been answered by such extension.

Having briefly remarked on the several Sections of the Index and their subdivisions, it remains only for us to say, that the great object has been to classify and arrange the details in all the grand divisions of knowledge in a satisfactory manner and within a moderate space. We believe that we have done this: and as regards History, Geography, and Natural Philosophy,—which certainly embrace the greater and the more useful part of human discovery and science,—we have no hesitation in saying that they are singularly complete in their details, very much more so than any candid reader could expect to find them in a miscellaneous work of comparatively limited extent. We therefore, now commend our labours to that public whose approval has hitherto cheered and sustained us through a protracted and laborious undertaking: fully convinced, that as we have used every endeavour to render the work deserving of their approbation, they will justly appreciate our exertions, and judge with candour.

GLASGOW, }
1841. }

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Antarctic Circle
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Area
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Anville, Jean Babtiste Bourguinon d'
Arrowsmith, A
BarbieduBocage, J.D.
Bell, James
Busching, Anthony Frederick
Cassin
Chabert, Joseph Bernard
Delisle, William
Ebeling, Christopher Daniel
Eratosthenes
Hassel, John George Henry
Hubner, John
Mela, Pomponius
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- Antar
- Arabian Sea
- Bassora
- Horeb
- Jidda
- Mecca
- Medina
- Mocha
- Meschid
- Red Sea
- Sabæans
- Sinai

History.
- Bedouins
- Midianites
- Saracens
- Wahabees

Biography.
- Assemannic, Simon
- Haroun
- Lokman
- Mohammed

Literature.
- Arabian Literature and Language
- Arabian Nights
- Alfarabi
- Enfic Writing
- Geber
- Moallakat
- Motanabbi
- Zobeide

Miscellaneous.
- Averroes
- Avincenna, or Ebn Sina
- Commerce
- El

ARMENIA.

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- Armenian
- Ararat

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- Chereen
- Tigranes

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ASSYRIA.

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- Assyria
- Arbela
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History.
- Ninus
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- Abdenhoven
- Aspern and Esslingen
- Austerlitz
- Baden
- Ban
- Bohemia
- Brody
- Capo d'Istria
- Carlovitza
- Coburg
- Colloredo
- Dalmatia
- Gallicia
- Hallein
- Hungary
- Idria
- Illyria
- Istria
- Laybach
- Lemberg
- Lintz
- Leoben
- Littorales
- Mantua
- Marchfield
- Marengo
- Meleda
- Monte Bello
- Moravia
- Pola
- Salzburg
- Sclavonia
- Silesia
- Stiria
- Trieste
- Transylvania
- Troppau
- Tyrol
- Valteline
- Verona
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- Zirknitz
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- Adersbach Mountains
- Bohemian and Bavarian Forest
- Budweiss
- Carlsbad
- Colin
- Culm
- Egra
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- Prague
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- Nopomack, John of

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- Austria
- [Ancient History to the year 182
- History under the House of Bamberg till 1282
- Under the House of Hapsburg from 1282, to 1526
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- History under the House of Hapsburg Lorraine from 1740, to 1790
- From 1790 to 1815]
- Austrian Empire, *s*
- Military District
- Passarowitz, Peace of
- Wagram, Battle of

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- Baden
- Baden, Louis William I.
- Blumauer, Aloysius
- Browne, Maximilian Ulysses, Count
- Bubua, Count of
- Chasteler, John Gabriel, Marquis of
- Cobentzl, John Philip, Count de
- Cobentzl, Louis, Count of
- Collin, Henry Joseph von
- Collin, Mathæus
- Dann, Count
- Eugene, Francis, of Savoy
- Francis I., Joseph Charles
- Kamutz, Prince of
- Koller, Baron of
- Loudon, Baron
- Maria Theresa *s*
- Mack, Baron von
- Schwartenberg, prince of
- Wallenstein, Albert, Count of.

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- Austrian Empire, *s*
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- Public Stocks

AZORES.

- Angra
- Fayal
- Michael, St
- Pico
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- Baal
- Chaldea
- Nabonasser
- Nebuchadnezzar

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- Andros
- Caique, Grand
- Cat Island

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- Aval

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- Majorca
- Minorca

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- Bridgetown.

BARBARY STATES.

TOPOGRAPHY.
- Algiers,
- Bona
- Jurgura
- Tripoli
- Tunis

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- Almohedes
- Barbarossa Aruch
- Barbarossa, Hayradin
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- Amberg
- Bamberg
- Benedictbeurn
- Berchtesgaden
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- Landshut
- Passan
- Muggendorf
- Munich
- Norlingen
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- Spire
- Wurtzburg, Grand Duchy of

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- Zentner, Baron von

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- Brabant, Duchy of
- Bruges
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- Courtray
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- Fleurus
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- Necrivinden
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- Ostend
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- Ramillies
- Scheldt
- Steenkerke
- Tirlemont
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- Verviers
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- Netherlands

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- Andreas, Valerius
- Lipsius, Justus
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- Chaquisaca
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- Bahia
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- Brazil
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- Diamond District
- Goyas
- Ituziango
- Maranham
- Minas Geraes
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BRITAIN, ANCIENT.

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- Adrian's Wall
- Agricola, C. J.
- Albion
- Asaph, St
- Asser, John
- Boadicea
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- [History of Great Britain
- The Civil State
- British Constitution
- The King
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- Rights of the people of Britain
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- Anastasius I.
- Anna Comnena
- Byzantine Historians
- Cantacuzenus, John
- Comneni
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- Chippeway
- Montmorency, Falls of
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- Nepissing
- Quebec
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- Carleton, Sir Guy
- Champlain, Samuel de

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- Fero
- Fortenventura
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CAPE VERD ISLANDS.

- Anthony Islands
- Jago

CARIBBEE ISLANDS.

- Anguilla
- Barbadoes
- Barbada
- Bartholomew, St
- Curaçoa
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- Dominica
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- Lucia, St
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- Cannæ
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- Hanno
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  - Valdivia
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  - Benavides
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  - Molina, Juan Ignacio

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- Cochin China, Empire of
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  - Bashee Islands
  - Cailas
  - Canton
  - Formosa
  - Hung-tcheou
  - Kien-long
  - Loo-choo
  - Macao
  - Pekin
  - Saghalien
  - Saigon
  - Yang-tse-kian
- History.
  - Amiot, Father
  - Bonzes
  - Fo, or Fohi
  - Gengis Khan
  - Halde, John Baptiste du
  - Macartney, Earl
  - Napier, Lord, *s.*
  - Opium, *s.*
- Miscellaneous.
  - China, *s*
  - [Cities
  - Bridges
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  - Domestic Habits
  - Trade with China]
  - Birds' Nests
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  - Confucius
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  - Montucci, Antonio
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- Topography.
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  - Angostura
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  - Bogota
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  - Carabobo
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  - Colombia, Republic of
  - Cucuta
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  - Icononzo
  - Maracaybo
  - Martha Santa
  - Panama
  - Panama, Isthmus of
  - Quito
  - Silong
- History.
  - Cordova, Jose M.
  - Miranda, Don Francisco
  - Sucre, Antonia Jose de
  - Zea, Francisco Antonio
- Miscellaneous.
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CUBA.

- Topography.
  - Bayamo
  - Maria de Puerto Principe, St
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DENMARK.

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  - Arens
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  - Bornholm
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  - Copenhagen
  - Christiansand
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  - Laaland
  - Langeland
  - Olivia
  - Scaggerac
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  - Sound
  - Struensee and Brandt
  - Zealand
- Biography in connection with Danish history.
  - Absolom
  - Caroline Matilda
  - Christian II.
  - Frederick V.
  - Margaret
  - Vokingr
- Biography in connection with Danish literature.
  - Baggeson, Jens
  - Ewald, John
  - Gerstenberg, Henry William Von
  - Holberg, Louis
  - Meibomius, Marcus
  - Saxo, Grammaticus
  - Suhm, Peter Frederic Von
  - Thaarup, Thomas
  - Thorlacius, Skule and Börge
  - Wormius, Olans
  - Zoega, George

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EGYPT.

- Miscellaneous.
  - Egypt
  - [Description
  - Political History of Egypt
  - Campaign of the French in Egypt]
  - Alme
  - Canals of Egypt
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  - Copt
  - Goshen
  - Hieroglyphics
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  - Monolithic
  - Mummies
  - Pyramids
  - Scarabeus
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  - Aboukir
  - Acanthus
  - Achmim
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  - Balac
  - Cairo
  - Damietta
  - Delta
  - Denderah
  - Elephantina
  - Emeh
  - Fayoum
  - Heliopolis
  - Gizeh
  - Luxor
  - Mœris
  - Memphis
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  - Necopolis
  - Pharos
  - Philœ
  - Rosetta
  - Sakhara
  - Suez
  - Suse
  - Syene
  - Thebes
- Biography in connection with the history of Egypt.
  - Cleopatra
  - Djezzar, Achmet
  - Mohammed Ali
  - Necho
  - Osymandyas
  - Ptolemy
  - Sesostris
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  - Sesostris
- Biography in connection with Egyptian antiquities.
  - Belzoni, Grambattista
  - Champollion
  - Manetho. See *Hieroglyphics*

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- England.
  - [Civil History
  - Ecclesiastical History
  - Antiquities and Architecture
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  - Civil Government
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- Wells
- Wessex
- Weymouth
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- Whitehaven
- White Horse Vale
- Wigan
- Winchester
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- Windsor
- Windsor Castle
- Wirksworth
- Wisbeach
- Witney
- Wolverhampton
- Woodbridge
- Woodstock
- Woolwich
- Worcester
- Workington
- Worksop
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  - Agitators
  - Agincourt
  - Angles
  - Anglo Saxon History
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    - [Lord High Chancellor of England
    - Vice Chancellor
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  - Runymede
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  - Alfred the Great
  - Anne of Cleaves
  - Anne
  - Boleyn, Anne
  - Canute I.
  - Catherine of Arragon
  - Catherine of Braganza
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  - Catherine Parr
  - Charles I.
  - Charles II.
  - Edgar
  - Edmund I.
  - Edmund II.
  - Edward the Confessor
  - Edward I.
  - Edward II.
  - Edward III.
  - Edward the Black Prince
  - Edward IV.
  - Edward V.
  - Edward VI.
  - Edwy
  - Egbert
  - Elizabeth
  - Ethelbert, King of Kent
  - Ethelbert, King of England
  - Ethelred I.
  - Ethelred II.
  - Ethelwolf
  - George I.
  - George II.
  - George III.
  - George IV.
  - Grey, Lady Jane
  - Hardicanute
  - Harold I.
  - Harold II.
  - Henry I.
  - Henry II.
  - Henry III.
  - Henry IV.
  - Henry V.
  - Henry VI.
  - Henry VII.
  - Henry VIII.
  - James I.
  - James II.
  - John, King of England
  - Margaret of Anjou
  - Mary I.
  - Mary II.
  - Richard I.
  - Richard II.
  - Richard III.
  - Stephen
  - Victoria Alexandrina

William I. surnamed the Conqueror
William II. surnamed Rufus
William III.
William IV.

PERSONAGES CONNECTED WITH ENGLISH HISTORY.

Adrian
Amherst, Jeffrey, Lord
Antenati
Arabella, Stuart
Athelstane
Atterbury, Francis
Babington, Anthony
Barbauld, Anna Lætitia
Bacon, Sir Nicholas, *s*
Barton, Elizabeth
Beaufort, Henry
Becket, Thomas
Beda
Bedford, John, duke of
Berry, Sir Edward, *s*
Bickerston, Sir Richard Hussey, *s*
Blood, Thomas
Bolingbroke, Henry, St John
Bonner, Edmund
Boyle, Richard
Boyle, Roger
Bradshaw, John
Buckinck, Arnold
Buckingham, George Villiers, Duke of
Burke, Edmund
Bute, John Stuart, Earl of
Butler, James, Duke of Ormond
Cade, John
Camden, Earl of
Campbell, John, Duke of Argyle
Canning, George
Caroline, Amelia Elizabeth
Cartwright, John
Cary, Lucins, Viscount Falkland
Carte, Thomas
Cavendish, William, first Duke of Devonshire
Cavendish, William, Duke of Newcastle
Cecil, Robert, Earl of Salisbury
Cecil, William, Lord Burleigh
Charlotte, Augusta
Chatham, Earl of
Cheke, Sir John
Churchill, John, Duke of Marlborough
Clarendon
Clifford, Ann
Clifford, Earl of Cumberland
Clinton, Sir Henry
Collingwood, Cuthbert
Cooper, Anthony Ashley, first Earl of Shaftesbury
Cromwell, Oliver
Cromwell, Thomas, Earl of Essex
Cumberland, Duke of
Despard, Edward Marcus
Devereux, Earl of Essex
Devereux, Earl of Essex, son of preceding
Dodd, William
Doddington, George Bubb
Dodsley, Robert
Dudley, Earl of Leicester
Dudley, Earl of, *s*
Dudley, Edmund
Duncan, Viscount
Dundas, Henry
Dudley, John
Eliott, George Augustus, Lord Heathfield
Exmouth, Lord, *s*
Fairfax, Thomas, Lord
Falstaff, Sir John
Finch, Earl of Nottingham
Fisher, John
Fitzwilliam, Earl, *s*
Fleetwood, Charles
Fox, Charles James
Gardiner, Stephen
Glanvil, Ranulph de
Glendower, Owen
Godolphin, Earl of
Goffe, William
Grenville, Lord, *s*
Gordon, George
Gresham, Sir Thomas
Gwynne, Eleanor
Halle, Edward
Hamilton, Sir William
Hamilton, Lady
Hamilton, William Gerard
Hampden, John
Harley, Robert
Hastings, Warren
Hastings, Francis
Hatton, Sir Christopher
Hengist
Holingshed
Hollis, Thomas
Hood, Lord
Hood, Robin
Howard, Thomas, Duke of Norfolk
Howard, Charles, Earl of Nottingham
Howe, Richard, Earl
Howe, Sir William
Howel the Good
Hunt, Henry, *s*
Ingulphus
Ireton, Henry
Johnson, Samuel
Jones, John Gale, *s*
Kent, Duke of
Keppel, Augustus
Kingston, Duchess of
Landsdowne, Marquis of
Lamb, Hon. George, *s*
Land, William
Latimer, Hugh
Lilburne, John
Lillo, George
Liverpool, Charles Jenkinson, Earl of
Liverpool, Robert Banks Jenkinson, Earl of
Londonderry, Marquis of
Ludlow, Edmund
Madoc
Malmesbury, William of
Marwell, Andrew
Masham, Abigail
Merlin, Ambrose
Monk, George, Duke of Albemarle
Monmouth, duke of
Montague, Earl of Halifax
Montford, Simon de
Moore, Sir John
More, Sir Thomas
Napier, Lord, *s*
Nelson, Horatio
Nichols, John
North, Francis
Oates, Titus
Oglethorpe, James Edward
Overbury, Sir Thomas
Paris, Matthew
Pepys, Samuel
Percival, Spencer
Peterborough, Earl of
Petus, Hugh
Pitt, William
Portland,
Pryme, William
Pulteney, William, Earl of Bath
Pym, John
Raleigh, Sir Walter
Rapin de Thoyeas, Paul
Ridley, Nicholas, Bishop of London
Rockingham, Marquis of
Rodney, Baron
Romilly, Sir Samuel
Rooke, Sir George
Rupert, Prince
Rushworth, John
Russel, Lord William
Sacheverell, Henry
Sadler, Michael Thomas, *s*
Savile, George, Marquis of Halifax
Seymour, Duke of Somerset
Schonberg, Duke of
Shore, Jane
Sidney, Algernon
Somers, Lord John
Spencer, Earl, *s*
Sprat, Thomas
Stafford, Earl of
Stanhope, James, first Earl of
Stanhope, Charles, third Earl of
Talbot, Earl of Shrewsbury
Taliesin
Temple, Sir William
Thistlewood, Arthur
Thurlow, Baron
Tierney, George
Vane, Sir Henry
Vaux, Lord
Vere, Edward
Vernon, Edward
Vincent, St., Earl of
Waller, Sir William
Walpole, Robert, Earl of Orford
Walsingham, Sir Francis
Warbeck, Perkin
Warham, William
Warren, Sir Peter
Warwick, Guy, Earl of
Wat Tyler
Wharton, Philip, Duke of
Wharton, Thomas, Marquis of
Whitbread, Samuel
Whitlock, Bulstrode
Whitworth, Charles Earl
Wilberforce, William
Wilkes, John
Wolfe, James
Wolsey, Thomas, Cardinal
Wotton, Sir Henry
Wright, Thomas
Wyatt, Sir Thomas
Wykeham, William of
Wyndham, Sir William
Yorke, Philip, first Earl of Hardwicke
York, Frederic, Duke of

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BIOGRAPHY.
Addison, Joseph
Adhelin
Ælfric
Aiken, John
Akenside, Mark
Alcock, Bishop of Ely
Alfred
Allein, Joseph
Allman, John

Ambrose, Isaac
Amory, Thomas
Andrews, James Petit
Andrews, Lancelot
Arbuthnot, John
Ascham, Roger
Asgill, John
Astell, Mary
Astley, Christopher
Austen, Jane
Bacon, Anthony
Bacon, Francis
Bacon, Roger
Bage, Robert
Baker, Henry
Baker, Sir Richard
Baker, Thomas
Baldwin, William
Bale, John
Bankes, Henry, *s*
Barclay, Alexander
Barker, E. H., *s*
Barrington, Daines
Barrow, Isaac
Bathurst, Allan, Earl
Baxter, Richard
Beaumont, Francis, and Fletcher, John
Beddoes, Thomas
Behn, Aphora
Belsham, William
Benger, E. O.
Bentham, Jeremy, and *s*
Bentley, Richard
Berners, Juliana
Bigland, John, *s*
Birch, Thomas
Blackmore, Sir Richard
Blomfield, Edward Valentine
Bloomfield, Robert
Booker, Luke, *s*
Boothroyd, Benjamin, *s*
Bowle, John
Boyle, Charles
Boyle, John
Broughton, Thomas Duer, *s*
Browne, Isaac Hawkins
Browne, Sir Thomas
Browne, William
Bryant, Jacob
Budgell, Eustace
Bunyan, John
Burder, George, *s*
Burgoyne, John
Burnet, Thomas
Burney, Charles
Burton, Robert
Butler, Charles, *s*
Butler, Samuel
Butler, Joseph
Byron, Lord
Calamy, Edmund
Camden, William
Carew, Thomas
Carrington, N. T. *s*
Carter, Elizabeth
Carteret, John
Cave, Edward
Chambers, Ephraim
Chamier, John, *s*
Chatterton, Thomas
Chaucer, Geoffrey
Chesterfield, Earl of
Chillingworth, William
Chubb, Thomas
Churchill, Charles
Clarke, James Stanier, *s*
Clarke, Samuel
Clutterbuck, Robert, *s*
Cobbett, William, *s*
Coleman, George
Coleridge, Samuel Taylor, *s*
Collins, William
Colman, George, the Younger, *s*
Colton, C. C. *s*
Combe, William
Congreve, William
Cooper, Anthony, Ashby, third Earl of Shaftesbury
Cowley, Abraham
Cowley, Hannah
Cowper, William
Coxe, William
Crabbe, George
Creech, Thomas
Cudworth, Ralph
Culhem, Sir John, *s*
Cumberland, Richard
Dallas, Sir George, *s*
Dalloway, James, *s*
Daniel, Samuel
Darwin, Erasmus
Davenant, Sir William
Davies, Robert, *s*
Day, Thomas
Decker, Thomas
Defoe, Daniel
Denham, Sir John
Dennis, John
Devonshire, Duchess of
Dibdin, Charles
Digby, Lord George
Digby, Sir Kenelm
Doddridge, Philip
Dodwell, Henry
Doune, John
Dover, Lord, *s*
Drake, Nathan, *s*
Drew, Samuel, *s*
Dryden, John
Dudley, Sir Henry Bute
Duppa, Richard, *s*
Dyer, John
Echard, Lawrence
Ellis, George
Ellwood, Thomas
Elmsby, Peter
Enfield, William
Etheredge, Sir George
Evelyn, John
Fairfax, Edward
Falconer, William
Falstaff, Sir John
Fanshawe, Sir Richard
Farmer, Richard
Farquhar, George
Feltham, Owen
Fenton, Elijah
Fielding, Henry
Fielding, Sarah
Flecknoe, Richard
Fletcher, Mrs. *s*
Fletcher, John
Fletcher, Phineas
Foote, Samuel
Ford, John
Fox, John
Fuller, Thomas
Garth, Samuel
Geoffrey of Monmouth
Gibbon, Edward
Gildas, Sapiens
Gifford, William
Glover, Richard
Godwin, Mary
Godwin, William, *s*
Good, John Mason
Gower, John
Gray, Thomas
Gray, John
Greville, Fulk, Lord Brooke
Hall, Robert
Hamilton, Elizabeth
Hammond, James
Hanmer, Sir Thomas
Harrington, James
Hartley, David
Hawkesworth, John
Hawkins, Sir John
Hayley, William
Hazlitt, William
Heber, Reginald
Hemans, Mrs. *s*
Herbert, George
Herbert, Lord
Herrick, Robert
Hervey, James
Higgins, Godfrey, *s*
Hill, Aaron
Hill, Sir John
Hill, Robert
Hoare, Prince, *s*
Hoare, Sir R. C. *s*
Holcroft, Thomas
Holles, Denzil, Lord
Hook, Nathaniel
Hooker, Richard
Hooker, Thomas
Hoole, John,
Hope, Thomas, and *s*
Horseley, Samuel
Hoveden, Roger de
Howard, Frederic, Earl of Carlisle
Howard, Henry, Earl of Surrey
Huntingdon, Henry of
Hurd, Richard
Inchbald, Elizabeth
Jenyns, Soame
Jodrell, Richard Paul, *s*
Johnes, Thomas
Johnson, Dr
Jonson, Benjamin
Jortin, John
Junius
Juxon, William
Keats, John
Killigrew
Kippis, Andrew
Lamb, Charles, *s*
Landon, L. E. *s*
Langelande, Robert
Lardner, Nathaniel
Law, William
Lawrence, John, *s*
Lee, Nathaniel
Lempriere, John
Lestrange, Sir Robert
Lewis, Matthew Gregory
Lightfoot, John
Lilly, John
Locke, John
Lodge, Edmund, *s*
Lovelace, Richard
Lowth, Robert
Lydiat, Thomas
Lyttleton, Lord
Macauley, Catharine
Mandeville, Bernard
Markland, Jeremiah
Marlowe, Christopher
Marsham, Sir John
Marston, John
Mason, William
Massinger, Philip
Matthias, Thomas James
Matthew of Westminster
Mavor, William, *s*
May, Thomas
Melmoth, William
Middleton, Conyers
Mildert, Bishop Van, *s*
Mills, Charles
Milner, John
Milton, John
Mitford, William
Montagu, Lady
Montagu, Edward Wortley
Montagu, Elizabeth
Moore, Edward
Moore, Henry
More, Hannah
Morell, Thomas
Nayler, James
Neal, Daniel
Neele, Henry
Newcombe, William
Newton, Thomas
Norton, Thomas
Orrery, Earl of
Otway, Thomas
Owen, John
Paley, William
Parnell, Thomas
Parr, Samuel
Percy, Thomas
Philips, Ambrose
Philips, John
Piozzi, Hester Lynch
Pitt, Christopher
Pocock, Isaac, *s*
Pomfret, John
Pope, Alexander
Poison, Richard
Potter, John
Potter, Robert
Pownall, Thomas
Preston, Thomas
Price, Richard
Prior, Matthew
Purchas, Samuel
Quarles, Francis
Radcliffe, Ann

Rees, Abraham
Reeve, Clara
Richardson, Samuel
Robinson, Robert
Rochester, Earl of
Roscoe, William
Rowe, Elizabeth
Rowe, Nicholas
Rymer, Thomas
Sacville, Charles, sixth Earl of Dorset
Sacville, Thomas, Earl of Dorset
Sandys, George
Savage, Richard
Scott, Thomas
Secker, Thomas
Sedley, Sir Charles
Selden, John
Settle, Elkanah
Seward, Anna
Shadwell, Thomas
Shakespeare, William
Sheffield, John, Duke of Buckingham
Shelly, Percy Bysshe
Shenstone, William
Sherlock, Thomas
Sherlock, William
Shirley, James
Sidney, Sir Philip
Skelton, John
Smart, Christopher
Smith, Charlotte
Somerville, William
Sotheby, William, *s*
South, Robert
Southern, Thomas
Spence, Joseph
Spenser, Edmund
Steevens, George
Sternhold, Thomas
Stevens, George Alexander
Stillingfleet, Edward
Stow, John
Strutt, Joseph
Strype, John
Suckling, Sir John
Taylor, Jane
Taylor, Jeremy
Taylor, John
Taylor, John, LL.D.
Taylor, Thomas
Taylor, Thomas, *s*
Teignmouth, Lord
Theobald, Louis
Thornton, Bonnell
Tickell, Thomas
Tillotson, John
Tooke, John Horne
Vanburgh, Sir John
Vincent, William
Wakefield, Gilbert
Waller, Edmund
Walpole, Horace, Earl of Orford
Walsingham, Thomas of
Warburton, William
Warton, Joseph
Warton, Thomas
Watson, Richard
Watts, Isaac
Webster, John
Wesley, Charles
Wesley, John
West, Gilbert
Whitby, Daniel
White, Henry Kirke
Whitefield, George
Whitehead, Paul
Whitehead, William
Wilkins, John
Williams, Helen Maria
Wither, George
Wolcot, John
Wollaston, William
Woolston, Thomas
Worcester, John Tiptoft, Earl of
Wotton, William
Wraxall, Sir Nathaniel
Wycherly, William
Young, Edward
Young, Thomas

DRAMA.

Biography.
Abington, Frances
Alleyn, Edward
Betterton, Thomas
Bannister, John, *s*
Billington, Elizabeth
Blanchard, William
Booth, Barton
Centlivre, Susanna
Cibber, Colley
Cibber, Theophilus
Clive, Catharine
Cooke, George Frederic
Egerton, Daniel, *s*
Elliston, Robert William
Emery, John
Garrick, David
Garrick, Eva Maria
Jordan, Dorothea
Kean, Edmund,
Kemble, John Philip
Matthews, Charles
Miller, Joseph
Mossop, Henry
O'Keefe, John, *s*
Oldfield, Ann
Quin, James
Siddons, Mrs
Woffington, Margaret

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Artois
Aude
Auteuil
Auvergne
Avesnes
Aveyron, Department de l'
Barfleur
Bayonne
Bearn
Beaucaire
Beauvais, *s*
Belle-Isle
Bensançon
Bercy
Bergerac
Blois
Bouches du Rhone
Bouillon
Boulogne
Bourbonnais
Bourdeaux
Bourges
Brest
Brienne
Brittany
Burgundy
Caen
Calais
Calais, Pas de
Calvados
Cambray
Cannes
Cantal
Carcassone, *s*
Cette
Cevennes
Chalons
Chamberry
Chambord
Chamouni
Champagne
Charente
Charenton
Charlemont and Givet
Chartres
Cherburg
Cloud, St
Cluny
Compiegne
Conde
Corsica
Cote d'Or
Crecy
Cyr, St
Dauphiny
Department
Dieppe
Dijon
Dunkirk
Elbeuf
Epernay
Ermenouville
Eure
Fontainbleau
Fontenay
France, Isle of
Franche-comte
Furca
Garonne
Gascony
Gatinais
Germain, St
Gironde
Grenoble
Havre de Grace
Hieres
Honfleur
Hunningen
Indre
Isere
La Hogue
Landrecies
Languedoc
Limoges
Limousin
Lisle
Loir-au-cher
Loire
Loiret
Longchamp
L'Orient
Lorraine
Lot
Louvre
Luneville
Luxembourg, Palace of
Lyonnais
Lyons
Lyons, Gulf of
Maine
Malmaison
Maloes, St
Maubeuge
Manche, Department of la
Marche
Marly
Marne
Marseilles
Medoc
Melun
Metz
Meudon
Meuse
Miquelets
Moncontour
Montauban
Mont D'Or
Mont Perdu
Montebelliard
Montpellier
Montronge
Montmorency
Morbihan
Nancy
Narbonne
Nantes
Nemours
Nimes
Normandy
Omer, St
Orleannais
Orleans
Ouen, St
Ourcy, Canal de l'

- Paris
  - [Bellevue
  - Bicetre
  - Boulogne, Wood of
  - Chaillot
  - Luxembourg
  - Morgue La
  - Palais Royal
  - Temple, Palace of the
  - Tuilleries]
- Passy
- Perpignan
- Picardy
- Piedmont
- Pierre, St
- Poitiers
- Poitou
- Port Royal des Champs
- Provence
- Pyrenees
- Quiberon
- Rambouillet
- Rennes
- Rheims
- Rhone
- Rochelle, la
- Roncesvalles
- Rouen
- Roussilon
- Saintonge
- Salm
- Seine
- Seine Department
- Seine, Lower
- Seine and Marne
- Seine and Oise
- Severes
- Soissons
- Sorbonne
- Strasburg
- Toulon
- Toulouse
- Touraine
- Tours
- Trianon
- Valenciennes
- Varennes
- Vaucluse
- Venaissin Comtat de
- Vendee
- Verdun
- Versailles
- Vienne
- Vincennes
- Vosges
- Yonne
- Yvetot

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HISTORY, MISCELLANEOUS.

- Angouleme
- Austerlitz
- Bar
- Blenheim
- Bourbon
- Burgundians
- Cachet, Lettre de
- Ca Ira
- Calottists
- Camisards
- Capet
- Carmagnole
- Centre
- Chambre Ardente
- Chambre Introuvable
- Champ-de-Mars
- Chatelet
- Chaumont, Treaty of
- Chouans
- Cisrhenish Republic
- Cloud, St
- Codes les Cinq
- Committee of Public Safety
- Confederation of the Rhine
- Conscription
- Constituent Assembly
- Consul
- Continental System
- Cordeliers
- Dauphin
- Directory
- Doctrinaires
- Fredegonde
- Friedland, Battle of
- Fronde
- Fructidor
- Gaul
- Gens D'Armes
- Girondists
- Grand National
- Gueux
- Hopital, Michael Del
- Jacobins
- Jeux, Floraux
- Legion of Honour
- Legislative Body
- Leipsic, Battles of
- Lit De Justice
- Malplaquet, Battle of
- Mandate
- Marengo
- Marseillaise Hymn
- Mask, the Iron
- Merovingians
- Montmartre
- National Domains
- Notables
- Notre Dame
- Orange
- Oriflamme
- Parisienne, la
- Prevot Cours
- Prevotales
- Pyrenees, Place of the
- Quand Meme
- Quatre Bras and Ligny, Battles of
- Royalists
- Sans Cullottes
- Septembriseurs
- Terror, Reign of
- Theophilanthropists
- Thermidor 9th
- Tiers Etat
- Tribunat
- Tribune
- Tricolore
- Vendee
- Wagram, Battle of
- Waterloo
- Wavre

SOVEREIGNS OF FRANCE.

- Bonaparte, Napoleon
- Charlemagne
- Charles IX.
- Clovis
- Dagobert I.
- Francis I.
- Francis II.
- Henry III.
- Henry IV.
- Josephine
- Louis IX.
- Louis XI.
- Louis XII.
- Louis XIV.
- Louis XV.
- Louis XVI.
- Louis XVII.
- Louis XVIII.
- Margaret of France
- Marie Antoinette
- Philip II.

PERSONAGES CONNECTED WITH FRENCH HISTORY.

- Agnes, Sorel
- Aguesseau, Henry Francis d'
- Aguillon, Duke d'
- Alembert, Jean le Rond d'
- Anne of Austria
- Arnauld
- Assas, Chevalier d'
- Autraigues, Emmanuel Louis Henry Launey
- Aubrey de Montdidier
- Augereau, Pierre François, Duke of Castiglione
- Babeuf, Francis Noel
- Bacchiocchi, Felix Pascal
- Barnard, Antoine Pierre Joseph Marie
- Barras, Paul François Jean Nicholas, Comte de
- Bassompierre, François de
- Bayard, Pierre du Terrail, Chevalier de
- Beauharnais, Alexander, Viscount
- Beauharnais, Marquis Francis de
- Bellard, Comte de
- Belleisle, Count de
- Bernis, Cardinal de
- Berri, Duke of
- Berthier, Alexander
- Berwick, James Fitz James, Duke of
- Biron, Charles de Goutant, Duke of
- Bonaparte, Napoleon
- Bonaparte, Napoleon Francis Joseph Charles
- Bonneval, Claude Alexander, Count of
- Boufflers, Stanislaus Chevalier de
- Borghese, Maria Pauline
- Bouille, Francis Claude Amour Marquis de
- Bougainville, Louis Antoine de
- Bourbon, Charles Duke of
- Breteuil, Louis Augustus le Tonnelier
- Brissot de Warville, Jean Pierre
- Broglis
- Brune, William, Maria Anne
- Burgundy, Louis, Duke of
- Calonne, Charles Alexander de
- Cambaceres, Jean Jacques Regis
- Campan, Jeanne Louise Henriette
- Carrier, John Baptist
- Cartouche, Louis Dominique
- Catherine de Medici
- Catinat, Nicholas
- Charles the Bold
- Charles Martel
- Charon, Duke of
- Chateaurux, Duchess of
- Cloots, John Baptist Von
- Colbert, Jean Baptiste
- Coligny, Gaspard de
- Comines, Philippe de
- Conde, Louis de Bourbon, Prince of
- Conde, Louis Henry Joseph, Duke of Bourbon
- Conde, Louis Joseph de Bourbon Prince of
- Constant de Rebecque, Benjamin de
- Corday d' Armans, Marie Anne Charlotte
- Cosse, Charles de
- Cottin, Charles
- Crillon, Louis de Balbe
- Damiens, Robert Francis
- Daniel, Gabriel
- Danton, George James
- Darn, Count
- Davoust, Louis Nicholas
- Denis, St
- D'Eon, the Chevalier
- Desaix, General
- Desmoulins, Benoit Camille
- Diana of Poitiers
- Diderot, Dennis
- Dubois, William Cardinal
- Duguay, T. Rene
- Dumoriez, General
- Dunois, Count of Orleans
- Duquesne, Abraham
- Duroc, Michael

Edgeworth, de Firmont, Henry Essex
Eginhard, Einard
Elbee, Gigot D'
Elizabeth Charlotte, Duchess of Orleans
Elizabeth of France
Enghien, Duke d'
Espremeuil, James Duval d'
Estrees, Gabrielle d'
Estrees, Louis Cæsar duc d'
Eugene de Beauharnois
Feltre, Duke of
Fleury, Andre Hercule de
Fouquier, Tinvelle Anthony Quintin
Foy, Maximilian Sebastian
Gaston de Foix
Ginguene, Peter Louis
Geoffrin, Madame
Gregoire, Henry Count
Gueelin, Bertrand du
Guillotin, Joseoh Ignatius
Hebert, James Rene
Henrietta, Duchess of Orleans
Herault de Sechelles, Marie Jean
Hoche, Lazarus
Hugh Capet
Joan of Arc
Kellermann, Duke of Valmy
Kleber, Jean Baptiste
Labarre, Chevalier de
Laborde, Jean Joseph de
Lachaise, François d'Aix de
Lafayette
Laffitte, Jacques
Lally, Count
Lally, Tollendal
Lamarque, Maximilian
Lamettre, Julian Offray de
Lamotte, Valois Countess of
Latour D'Auvergne Corret, Theophilus de
Latude, Henry Mazers
Lauriston, Count de
Lavalette
Lavalette, Count de
Law, John
Lebrun, Charles François, Duke of Placentia
Lefebvre, Duke of Dantzic
Lenclos, Anne
Loban, George Mouton
Loizerolles, M. de
Lomeine de Brienne, Stephen Charles
Louvel, Pierre Louis
Louvet de Couvray, Jean Baptist
Louvois, Marquis of
Luxembourg, Duke of
Luynes, Duke de
Luzerne, Anne Cesar de la
Maintenon, Marchioness of
Malesherbes
Malet, Charles François
Manuel, Jacques Antoine
Marat, Jean Paul
Margaret of Valois
Mary of Medici
Massena, Andre
Maubreuil, Marquis de
Maury, Jean Siffrein
Maurepas, Count de
Mazarin, Julius
Menon, Baron de
Mole, Matthew
Monstrelet, Enguerrand de
Montcalm, de Saint Veram Marquis
Montespan, Marchioness de
Montgomery, Count de
Montmorency, Annede
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Montpensier, Mademoiselle de
Moreau, Jean Victor
Mounier, Jean Joseph
Murat, Joachim
Narbonne, Lara
Necker, James
Ney, Michel
Orleans, Gaston Jean Baptiste de France, Duke of
Orleans, Philip, Duke of
Orleans, Louis Joseph Philip, Duke of
Paulette
Perier, Casimir
Pethion, Jerome
Pichegru, Charles
Polignac, Melchior
Pompadour, Marchioness de
Rabaut de St Etienne, John Paul
Rapp, John, Count of
Ravaillac, Francis
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Revelliere Lepaux, Louis Marie la
Richelieu, Armand Jean du Plessis, Cardinal, Duke de
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Rochambeau, Comte de
Rochefoucauld-Liancourt, Duke de la
Rochejaquelein, Henri de la
Robespierre, Maximilian Isidore
Rohan, Prince de
Roland, Jean Marie Baptiste de la
Saxe Meurice, Count de
Schneider, Eulogius
Suchet, Louis Gabriel
Sully, Maximilian de Bethune, Duke de
Tallart, Duke de
Talleyrand, Prince,
Terray, Joseph Marie
Theroigne de Mericourt
Thibaut, Count of Champagne
Turenne, Vicomte de
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Arnaud, François Thomas Baculard d'
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Arnoult, Sophie
Aublique, Theodore Agrippa d'
Aunoy, Countess of
Bachaumont, François le Coigneux de
Balzac, Jean Louis Guez de
Barbazan, Etienne
Barbeyrac, John
Barthelemy, Jean Jacques
Batteux, Charles
Bayle, Pierre
Beaumarchais, Pierre Augustin Carron de
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Beir, Michael
Belloy, Pierre Laurent Bruiette de
Benserade, Isaac de
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Boccage, Marie Anne de
Boileau, Desperaux Nicholas
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Brantome, Pierre de Bourdeilles
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Bruyere, John de la
Bude, Guillaume
Cadoudal, George
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Calprende, Gauthier de Costes de la
Campistron. Jean Gilbert de
Caraccioli, Louis Antoine de
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Chapelain, Jean
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Corneille, Thomas
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Arminius
Aventine, John
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Buckler, John
Catharine Pawlowna
Charles IV.
Charles V.
Christopher
Cosel, Countess of
Dalberg, Charles Theodore Anthony Maria
Elizabeth, St
Ferdinand
Francis I.
Frederic I.
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Frondsberg, George of
Galen, Bishop of Munster
Gichtel, John George
Henry I.
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Henry, Duke of Brunswick
John the Parricide
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Rodolph I.
Sand, Charles Louis
Sickengen, Francis Von
Stapss, Frederic
Tilly, Count of
Walpurga
Welser
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Wettin, Counts of
William I. Elector o Hesse
Wittekind
Yvernois, Sir Francis D' Zisca
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Archenholz, John William Von
Aretin, Baron of
Arnd, John
Bahrdt, Charles Frederic
Balde, Jacob
Bergstrasse
Bernardi, Augustus Frederic
Bodmer, John Jacob
Boner, Ulrich
Bouterwek, Frederic
Brandes, Ernest
Brandt, Sebastian
Bredow, Gabriel Godfrey
Brunck, Richard Francis Philip
Burger, Godfrey Augustus
Burmann
Burmann, Gottlob William
Camerarius
Celtes, Conrad
Claudius, Matthias
Conring, Hermann
Contessa
Cramer, John Andrew
Cotta, J. G.
Dach, Simon
Eichorn, J. G. *s*
Engel, John James
Ernesti, Augustus William
Ernesti, John Augustus
Erhard, John Benjamin
Eschenbach, Wolfram Von
Eschenburg, John Joachim
Eulenspiegel, Tyll
Ewald, John Lewis
Fabricius, John Albert
Falk, John Daniel
Fernow, Charles Louis
Fichte, John Gottlieb
Fischart, John
Flascius, Matthias
Flogel, Charles Frederic
Folz, Hans
Formey, John Samuel
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Fraunlob, Henry
Gallitzin, Amalia
Gatterer, John Christopher
Gedike, Frederic
Gellert, Christian Furchtegott
Gerhard, Paul
Gesner, Conrad
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Gleditsch, John Theophilus
Gleim, John William Louis
Godfrey of Strasburg
Goeckingk, Leopold Frederic Gunther Von
Goethe, John Wolfgang Von
Gottsched, John Christopher
Grævius, John George
Grave, Christian
Gryphius, Andrew
Guths-Meths, John Christian Frederick
Hagedorn, Frederic
Hardenberg, Frederic Von
Harsdorfer, George Philip
Heinneccius, John Gottlieb
Helvig, Amalia Von
Henke, Henry Philip Conrad
Herder, John Godfrey Von
Hermann, John George
Heyne, Christian Gottlob
Hindenburg, Charles Frederic
Hoffman, Ernest Theodore Amadeus
Holty, Lewis Henry Christopher
Horneck, Ottacar of
Iffland, Augustus William
Jablonsky
Jacobi, John George
Jacobi, Frederic Henry
Jacob's, Frederic Christian William
Oberlin, Jeremiah Jacob
Jerusalem, John Frederic William
Joecher, Christian Theophilus
Jung, John Henry
Junger, John Frederic
Kæstner, Abraham Gotthelf
Karshin, Anna Louisa
Kircher, Athanasius
Kish, Ephraim Moses
Kleist, Ewald Christian Von
Klingemann, Augustus
Klinger, Frederic Maximilian Von
Klopstock, Frederic Gottlieb
Klotz, Christian Adolphus
Knigge, Baron de
Korner, Theodore
Kosegarten, Louis Theobul
Kotzebue
Krunitz, John George
Lafontaine, Augustus
Leibnitz, Gottfried Wilhelm
Lessing, Gotthold Ephraim
Lichtenberg, George Christopher
Logau, Baron of
Lohenstein, Daniel Caspar Von
Macaber
Mannert, Conrad
Manso, John Caspar Frederic
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Mensil, John George
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Nicander
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Niemeyer, Augustus Hermann
Ofterdingen, Henry of
Pleffel, Christian Frederic
Pleffel, Gottlieb Conrad
Posselt, Ernest Louis
Pufendorf, Samuel Baron Von
Rabener, Gottlieb William
Ramler, Charles William
Reichardt, John Frederic
Reinhard, Francis Volkmar
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Reiske, John James
Reuchlin, John
Richter, Jean Paul Frederic
Ritter, John William
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Ruhnkenius, David
Sachs, Hans
Schiller, John Christopher Frederic Von
Schlegel
Schleiermacher, Frederic Daniel Ernest
Schmidt, Michael Ignatius
Schubart, Christian Frederic Daniel
Seckendorf, Louis Von
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Velde, Francis Charles Van de
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Willamor, John Theophilus
Winkelmann, John Joachim
Winkler, John Henry
Wolf, Arnoldina
Wolf, Christian Frederic Von
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Woltmann, Charles Louis Von
Zachariæ, Just Frederic William
Zimmermann, Eberhard Augustus William Von
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Beckmann, John
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- Xenophon
- Zoilus

Greek Philosophy.

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- Æschines
- Ammonius
- Anacharsis the Younger
- Andronicus of Rhodes
- Antisthenes
- Appolonius of Rhodes
- Appolonius of Tyana in Cappadocia
- Arcesilaus
- Archytas of Tarentum
- Aristippus
- Aristotle
- Chrysippus
- Democritus
- Diogenes of Sinope
- Empedocles
- Epictetus
- Epicurus
- Heraclitus
- Hypatia
- Leontium
- Leucippus
- Maximus, Tyrius
- Melissus
- Menedemus of Eretria
- Parmenides
- Phædron
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- Plato
- Protagoras
- Pyrrho
- Pythagoras
- Sextus
- Socrates
- Thales
- Timæus
- Timon
- Xenocrates
- Xenophanes
- Zamolxi
- Zeno, the Eleatic
- Zeno, the founder of the Stoic sect

Miscellaneous.

- Alexandrian School
- Anthology
- Cynics
- Cyrenaics
- Eclectics
- Eleatic
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- Ionian Philosophy
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- New Platonists
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- Greece, [Revolution of Modern]
- Arnoots
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- Scutari

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- Capo D'Istria, John Count of
- Ypsilanti
- Zabira, George
- Zonaras, John

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- Greece, [Modern Greek Language, (called Romaic)and Literature]
- Greece, *s*
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- Hanover, and *s*
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- Cape Haytien
- Cayes Les
- Limonade
- Port Republican

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- Christophe
- Dessalines, Jean Jacques
- Petion, Alexandre
- Toussaint, Louverture

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- Amsterdam
- Breda
- Briel
- Casand
- Cuxhaven
- Delft
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- Gouda
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- Netherlands
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- Walcheren
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- Zeyst
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Biography.

- Barneveldt, John Van Olden
- Daendels, Hermann William
- De Witt, John
- Egmont, Count of
- Erasmus, Desiderius
- Everston, John
- Fagel
- Hein, Peter Peterson
- Heinsius
- Johannes Secundus
- Kursbergen, John Henry Van
- Maurice, Prince of Nassau
- Ruyter, Michael L. Adrian
- Schimmelpeninnk, Rutger Jan
- Tromp, Martin Hapertzoon
- Van Speyk, John Charles Joseph
- William I. king of the Netherlands
- WilliamI.the Younger
- Winter, John William de

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- Amsterdam, Bank of
- Bankruptcy
- Barrier Treaty
- Canal
- Commerce
- Grand Pensionary
- Hamburg Bank
- Low Dutch and High Dutch
- Public Stocks
- Stadtholder
- Treckschuyt

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- Bakku
- Bekker, Elizabeth
- Bellamy, James
- Bilderdyk, William
- Brockhuzen, Jan Van
- Commelin, Isaac
- Commelin, Jerome, of Douay
- Deken, Agathe
- Dousa
- Feith Rhynois
- Grotius, Hugo
- Helmees, John Frederick
- Hemsterhuis, Francis
- Hemsterhuis, Tiberias
- Hooft, Peter Cornelius Van
- Meerman, John
- Meursius, John
- Orville,JamesPhilipd'
- Panu, Cornelius de
- Perizonius, James
- Swinden, John Henry Van
- Vondel,Joost Vander
- Wagenaar, John

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- Buda
- Clausenburg
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- Funkkirchen
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- Attila
- Hunniades, John Corvinus
- Matthius Corvinus
- Ragotski, Francis

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- Benjowsky
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- Dietalia Acta
- Huns
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- Edda
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  - Dacca
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  - Elephanta
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  - Alme
  - Amretsir
  - Avadontas
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  - Baber
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  - Gymnosophists
  - Hole, Black
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  - Albuquerque, Alfonso de
  - Almeida, Francisco and Lorenzo
  - Aureng-zebe
  - Baird, Sir David
  - Boigne, Count
  - Church, Benjamin
  - Clive, Lord
  - Condorcanqui, Joseph Gabriel
  - Eliot, John
  - Hontmann, Cornelius
  - Hyder Ali Khan
  - Juliana
  - Macarthy, Sir Charles
  - Malcolm, Sir John
  - Ochterlony, Sir David
  - Philip, King
  - Raffles, Sir Thomas Stamford
  - Rammohun Roy
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INDIAN [AMERICAN] TRIBES.

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- Choctaws
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- Fox Indians
- Hontan, Baron de la
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- Mohawks
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- Tsulakees
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IRELAND.

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  - Armagh
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  - Clare
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  - Connaught
  - Cove of Cork
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  - Dee
  - Devil's Punch Bowl
  - Donaghadee
  - Donegal
  - Down
  - Downpatrick
  - Drogheda
  - Dublin
  - Dunloh Castle, *s*
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  - Kildare County, *s*
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  - Meath,
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- Roscommon
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- Ulster
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- Westmeath
- Wexford County
- Wexford Town
- Wicklow
- Youghal

Miscellaneous.

- Banks
- Brehon
- Hibernia
- Keeners
- Orangemen
- Trinity College

LITERATURE.

- Burke, Edmund
- Carolan, *s*
- Charleville, Earl of, *s*
- Curran, John Philpot
- Edgeworth, Richard Lovell
- Emmet, Thomas Addis
- Goldsmith, Oliver
- Grattan, Henry
- Johnstone, Charles
- Kirwan, Walter Blake
- Macklin, Charles
- Magee, William
- Malone, Edmund
- Maturin, Charles
- Murphy, Arthur
- O'Keefe, John, *s*
- O'Meara, Barry Edward, *s*
- Roscommon, Earl of
- Sheridan, Richard Brinsley
- Sheridan, Thomas
- Steele, Sir Richard
- Sterne, Lawrence
- Swift, Jonathan
- Tate, Nahum
- Toland, John
- Usher, James
- Wolfe, Charles

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- Italy
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- Abano, *s*
- Alexandria
- Amalfi
- Ancona
- Aquila
- Arezzo
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- Avernus
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- Bergamo
- Bologna
- Borromei Islands
- Brescia
- Calabria
- Campagna di Roma
- Canosa
- Church, States of the
- Civita Vecchia
- Como
- Como, Lake
- Corsica
- Cortona
- Cosenza
- Cremona
- Crotona
- Elba
- Etruria
- Faenza
- Feltre
- Ferrara
- Fiurne
- Florence
- Foligno
- Fondi
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- Gaeta
- Genoa
- Guastalla
- Ischia
- Herculaneum
- Lago Maggiore
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- Lagoon
- Latium
- Lavinium
- Lavona
- Leghorn
- Liguria
- Lodi
- Lombardy
- Loretto
- Lucca
- Mal'aria
- Magna Græcia
- Mantua
- Marignano
- Marino, San
- Maremme
- Massa-Carrara
- Menzabano
- Messina
- Milan
- Mincio
- Modena
- Monaco
- Mondovi
- Monte Casino
- Monte Circello
- Monte Fiascone
- Monte Notte
- Monte Nuovo
- Monza
- Naples
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- Padua
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- Perugia
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- Piombino
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- Ravenna
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- Rivoli
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HISTORY.

Miscellaneous.

- Bandit
- Cisalpine Republic
- Gondelier
- Lombards
- Milan, Duchy of
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- Borgia, Cæsar
- Calderari
- Capello, Bianca
- Carbonari
- Charles VII.
- Condottieri
- Contarini
- Dandolo Henry
- Este
- Farnese
- Ferdinand III.
- Fiesco, Count of Lavagna
- Fonseca, Eleanor
- Gherardesca
- Gonzaga
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- Guicciardini, Francis
- Guiscard, Robert
- Imperiali Lercari, Francis Maria
- Lando Michel
- Machiavelli, Nicolo
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- Medici, Luigi Don
- Morosini, Francesco
- Murat, Joachim
- Orsini
- Parini, Guiseppe
- Pazzi
- Rienzi, Nicholus Gabrini de
- Sforza
- Strozzi, Philip
- Visconti

LITERATURE.

- Adriani, John Baptist
- Agnesi, Maria Gaetana
- Alamanni, Luigi
- Albertini, Francis
- Alexander ab Alexandro
- Alfieri, Vittorio
- Algarotti, Francesco
- Ammirato, Scipio
- Andreas, Onuphrius
- Andreini, Francis
- Angeli, Peter
- Aragon, Tullia d'
- Aretino, Guido
- Aretino, Leonard
- Aretino, Pietro
- Ariosto, Ludovico
- Bandello, Matteo
- Barbarino, Francesco da
- Baretti, Joseph
- Bembo, Pietro
- Bentivoglio, Cornelio
- Bentivoglio, Gui
- Berni, Francesco
- Bettinelli, Saverio
- Biagioli, Josaphat
- Bianchini, Francesco
- Boccaccio, Giovanni
- Boiardo, Matteo Maurice
- Botta, Carlo, *s*
- Bruno of Arezzo
- Burchiello, Domenico
- Carli, Count
- Caro, Annibal
- Casa, Giovanni Della
- Casanova, John James
- Casti, Giambatista
- Castiglione, Baldassare
- Cavalcanti, Guido
- Cesarotti, Melchior
- Chiabrera, Gabriel
- Chiari, Pietro
- Cino da Pistoia
- Colletta, Peter, *s*
- Colonna, Vittoria
- Crescimbeni, Giovanni Maria
- Dandolo, Andrew
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- Davila, Arrigo Caterino
- Denina, Giacomo Carlo
- Fabroni, Angelo
- Fabroni, Giovanne
- Facciolato, James

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Ficino, Marsilio
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Galiani, Ferdinand
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Guarini, Giovanni Battista
Jagemann, Christian Joseph
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Martyr, Peter
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Nani, John Baptist Felix Gaspar
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Petrarca, Francesco
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Zanotti, Francesco Maria
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  - Horn, Philip II. Count of
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  - Harold I.
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  - Media
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  - Zeres, Francis
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- Literature.
  - Desatir
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- Topography.
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  - Caxamarca
  - Chimu
  - Chulucanas
  - Cusco
  - Guamanga
  - Guanca Velica
  - Lima
  - Nevados de Illimani.
- History.
  - Almagro, Diego
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Alexis Michaelovitsch
Alexis Petrovitsch
Anna Ivanowna
Anthing Fredric
Beering, Vitus
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Daschkoff, Princess of
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Continental System
Convention
Corporation
Council of State
Delegation
Diplomacy
Diplomatics
Election
Estates
Federal Government
Feudal System
Hereditary Offices
Holy Alliance
Impeachment
Independence
Indirect
Institutions
Intervention
League
Legislation, Houses of
Legitimacy
Liberal
Liberty Tree
Liberty, Cap of
Machiavellism
Magistrate
Manifesto
Mediation
Memorial
Ministers
Ministers, Foreign
Monocrat
Nations, Law of
Natural Law
Nobility
Oligarchy
Opposition
Organic Laws
Parliament
Patriot
Peace
Petition
Plurality
Police
Polyarchy
Powers, Great, of Europe
Prefectures
Press, Liberty of the
Primogeniture
Protocol
Province
Public Debt
Quadruple and Quintuple Alliance
Queen
Regalia
Regent
Relation
Representative Governments
Restoration
Revolution and Insurrection
Rosicrucians
Secretary
Senate
Septennial Elections
Servile
Sinecure
Sovereign
Speaker
Sphragistics
State
Steward
Suffragium
Timocracy
Toleration
Tory
Ultimatum
Ultra
Veto
War
TITLES.
Alcalde
Alderman
Archons
Baccalaureus
Captain
Catholic Majesty
Chamberlain
Chancellor
Chiaous
Cicerone
Cicisbeo
Constable
Cornet
Counsellor
Count
Dan
Dean
Defender of the Faith
Degree
Despot
Doctor
Doge
Don
Duke
Earl
Effendi
Elders
Eminence
Emir
Emperor
Equerry
Esquire
Exarchate
Excellency
Gentleman
Highness
Imperator
Infante
Jarl
King
Legation
Lieutenant
Licentiate
Madame
Magnificence
Maitre
Majesty
Major Domus
Marquis
Marshall
Marshall of England
Master of Arts
Master of the Horse
Monseigneur
Most Christian Majesty
Pacificator
Padishah
Palatine
Patriarchs
Peer
Proctor
Procurator
Provost
Reverend
Sheriff
Sir
Syndic
Thane
Title
Viscount

III.

POLITICAL ECONOMY.

Absenteeism, *s*
Army, Standing
Bande Noire
Bank
Bank, Saving
Bounty
Bullion
Capital
Circulating Medium
Coinage, *s*
Colony
Colonization Society

Consumption
Co-operative Societies
Corn Laws
Credit
Criminal Law
Direct Tax
Emigration
Freedom of Corporation
Funding System
Funds, Public
Guild
Joint Stock Companies
Labour
Labour Saving Machines
Land, Property in
Loan, Public
Machinery, Effects of, *s*
Mercantile System
Metalliques
Money
Monopoly
National Law
Omnium
Pauperism
Physiocratic, or Agricultural System
Population, Policy of
Posts, *s*
Public Debt
Public Lands
Public Stocks
Railways, *s*
Registration of Births Deaths and Marriages, *s*
Sinking Fund
Stamped Paper
Standard of Money
Staple
Stock Exchange
Tale
Taxes
Tithes
Towns
Usury
Utilitarians
Value
Wages
Weights, *s*

Writers on Political Economy.
Bodin, Jean
Cabot, George
Colquhoun, Patrick
Dumont, Stephen
Hamilton, Robert
Heinitz, Anthony Frederic
Huskisson, William
Lauderdale, James, Earl of, *s*
Macchiavelli, Nicolo
Malthus, Thomas Robert, *s*
Morton, Sir Frederic
Paine, Thomas
Quesney, Francis
Ricardo, David
Sadler, Michael Thomas, *s*
Say, Jean Baptiste
Smith, Adam
Turgot, Anne Robert Jacques

Commerce.
Adventure
Adventurers
African Company
Agis
American Company
Annuities
Assignat
Assignation
Atlas
Auction
Auctioneer
Average
Balance of Trade
Bank
Bankrupt
Barratry
Bill of Exchange
Bill of Health
Bill of Lading
Book-Keeping
Bottomry
Broker
Caffila
Canal
Caravan
Carrier
Charter-Party
Circulating Medium
Coal, *s*
Commerce
Consols
Continental System
Cork, and *s*
Cotton, and *s*
Colony
Commercial Courts
Commercial Law
Credit
Discount
Docks
Drawback
Earnest
Eggs, *s*
East India Company
Embargo
Freight
Fur-Trade, and *s*
Gloves
Grace, Days of
Gross
Guild
Ivory
Kelp
Licences
Lloyd's List
Net
North-west Coast of South America
Octroi
Obligation
Opium, *s*
Ordinances of Bilbao
Par
Passive and Active Trade
Port
Posts, *s*
Primage
Prize
Ship
Stock Exchange
Stuff
Tare
Tariff
Tea
Tobacco
Transit Trade
Trinity House
Wool

Insurance.
Annuities
Deviation
Expectation
Insurance, and *s*
Lloyd's Coffee-House
Mortality
Perpetuity
Re-Insurance
Tontines

IV.

ARMY AND NAVY.

Military Officers.
Adjutant
Adjutant General
Captain
Captain General
Captain Lieutenant
Colonel
Ensign
General of an Army
Major
Officers, Field
Officers, General
Provost Marshall
Serjeant
Staff

Military Bodies.
Brigade
Cavalry, and *s*
Company
Dragoon
Forlorn Hope
Grenadier
Guards
Hussars
Infantry
Light Infantry
Pioneers
Rear-guard
Regiment
Reserve
Sharp-Shooters
Tirailleurs
Vanguard
Vedette
Velites
Veterans
Volunteers
Wings
Worm

Military Manœuvres.
Battalion
Camp
Column
Hollow Square
Parallel Lines
Phalanx
Square

Artillery and large Arms.
Artillery
Balistæ
Battering Ram
Battery
Cannon, and *s*
Carronades
Catapults
Field Pieces
Gun
Howitzer
Mortar
Swivel

Small Arms.
Arms
Battle-axe
Bayonet
Bow
Broad Sword
Carabine
Cross-bow
Cutlass
Fire-arms
Halberd

Half-pike
Harquebuss
Lance
Mace
Musketoon
Sling
Sword
AMMUNITION.
Ammunition
Bomb
Caltrop
Cartouch
Cartridge
Case-shot
Cross-bar shot
Fire, Greek
Grape Shot
Grapling
Grenade
Mine
Petard
Peterero
Shot
Wad
ARMOUR AND DEFENCES.
Armour
Barricade
Blinds
Breast Plate
Breast Works
Chevaux de Frise
Circumvallation
Cuirass
Echelon
Fascines
Field Works
Helmet
Intrenchment
Mail, Coat of
Mantelets
Martinet
Morion
Palisades
Shield
Testudo
Torpedo
FORTIFICATION.
Banquette
Barbette
Bastion
Blockhouse
Bonnet
Casemates
Cavalier
Citadel
Contravallation
Counterguards
Counterscarp
Covered Way
Donjon
Esplanade
Flank
Fort
Fortification
Fortress
Fosse
Glacis
Half Moon
Lunette
Martello Towers
Merlin
Moat
Orillon
Outworks
Parapet
Pickets
Portcullis
Postern
Ravelin
Redoubt
Saucission
Scarp
Tambour
Trenches
Miscellaneous.
Amusette
Archery
Army
Army, Standing
Arsenal
Attack
Banner
Base
Battle
Bed
Brevet
Bivouack
Blockade
Bomb Ketch
Breach
Brigandine
Caisson
Calibre
Campaign
Canteen
Capitulation
Caponier
Carcass
Cartel
Castramentation
Century
Chamade
Champ de Bataille
Cheval A.
Conquest
Conscription
Contingent
Cordon
Corps
Coup
Cross Fire
Defile
Demonstration
Deploy
Deserter
Dismounting
Diversion
Enfilade
Epaulette
Eprouvette
Escalade
Escort
Evolutions
Flag
Flanqueurs
Forage
Garrison
Guides
Gunnery
Honours of War
Horizontal Range
Invalids
Inversion
Laboratory
Langrel
Levee-en-Masse
Level
Manœuvre
March
Martial Law
Material and Moral
Mess
Military Roads
Military Schools
Military Sciences
Militia
Muster
Muster Roll
Neutrality
Parole
Pass Parole
Patrole
Point Blanc
Quartering of Soldiers
Rammer
Range
Rank
Ration
Reconnoitre
Retrenchment
Sally
Saucisse
Saucission
Siege
Soldier
Spunge
Standard
Strategy
Subsidies
Tactics Proper
Terrain
Waggons
War
WRITERS ON THE MILITARY ART.
Arcon, Jean Claude Eleonore d'
Berenhorst, Francis Leopold Von
Bulow, Henry Von
Coehorn, Menno Baron of
Congreve, Sir William
Folard, Chevalier de
Guibert, Count of
Guischard, Charles Gottlieb
Guise, Henry
Lloyd, Henry
Macdonald, John
Montalembert, Marquis de
Polybius
Tempelhoff, George Frederic Von
Vega, Baron de
Vegetius, Renatus Flavius
Zeno, Nicholas and Anthony.

NAVY AND NAVIGATION.

Admiral
Admiral Courts
Afore
Aft
A-hull
A-lee
All Hands Hoay
All in the Wind
Almanac Nautical
Amidships
Anchor
A-Peak
Armed Ship
Athwart
Athwart-Hawse
Atrip
A-weigh
Balancing
Ballast
Binnacle
Blocks
Boat
Brails
Breakers
Breeching
Bring-to
Broach-to
Broadside
Bulk heads
Cabin
Cable
Caboose
Canal
Canoe
Cap
Capstan
Captain of a Merchant Ship
Careening
Caulking
Chain
Channels
Close-quarters
Close-hauled
Cockswain
Colony
Commodore
Compass, the Mariner's
Convoy
Corsairs
Crab
Cradle
Craft
Cruisers
Cutter
Cut-Water
Davis's Straits
Davit
Dead-eye
Dead-Reckoning
Deck
Docks
Dogger
Doubling
Draught
Embayed
Fake
Fashion Pieces
Fire Ships
Flag Staff
Floor Timbers
Flooring
Flotsam
Fore
Fore and Aft
Fore Row line
Fore Braces
Forecastle
Forecastle Men
Fore Tackle
Fore-top Men
Fothering
Founder
Foul
Frigate

Galleon
Galley
Galliot
Gang
Gang-board
Gangway
Gantlope
Gasket
Gimbals
Grapnel
Gratings
Ground Tackle
Gunter's Scale
Gunwale
Guy
Hailing
Hammock
Handspike
Helm
Hold
Jury Mast
Kedge
Keel
Keelson
Keep
Keeper Boat
Ketch
Knee
Labouring
Land
Land's end
Lane
Larboard
Lead
Lee
Leeward
Letter of Mart
Life Buoy
Life Preservers
Lighthouses
Locker
Log
Log-Board
Log Book
Loxodromic Curve
Lubber
Lubber's Hole
Luff
Lugger
Lug Sail
Lying-to
Main Mast
Manifest
Mast
Mizzen
Moor To
Navigation
Navy
Neaped
North Polar Expeditions
North America, *s*
Oakum
Oar
Offing
Oleron Laws
Orlop
Out of Trim
Parallel Sailing
Peak
Pillow
Pinnace
Pole-axe
Point
Port
Port-hole
Press of Sail
Press-Gang
Privateer
Prize
Quarantine
Quarter of a Point
Quarter
Quarter Master
Raft
Rake
Raking
Rate
Ratlines
Razee
Reef
Reefing
Reeving
Rendezvous
Rigging
Sallyport
Salvage
Schooner
Scuppers
Scupper-Hose
Scuttling
Seamen
Serving
Sheathing
Sheer
Sheet
Ship
Shrouds
Signals
Sloop
Slops
Snow
Sounding
Splicing
Splinters
Splinter-Netting
Spring
Sprit
Spun Yarn
Starboard
Stay
Steam Navigation
Stem
Steerage
Stern
Stern Post
Steward
Stink Pot
Streaks
Studding Sails
Tackle
Taffarel
Tarpauling
Taught
Taunt
Timbers
Top
Top Mast
Transoms
Tree Nails
Tripping
Trying
Warp
Wear
Well
Windsails
Windward Passage
Worm
Wreck Yard
Xebec
Yacht
Yard-arm, Yard-arm and Yard-arm.

NAVIGATORS.

Americus, Vespucius
Anson, Lord George
Baffin, William
Bougainville, Louis Antoine de
Byron, John
Cabot, Sebastian
Cavendish, Thomas
Circumnavigators
Columbus, Christopher
Cook, James
Dampier, William
Davis, John
Diaz
Diemen, Anthony Von
Drake, Sir Francis
Frobisher, Sir Martin
Gama, Vasco de
Gilbert, Sir Humphrey
Gioja, Flavio
Hawkins, Sir John
Henry the Navigator
Hudson, Henry
Kerguelen, Tremaree
La Perouse
Magalhaens, Fernando de
Mulgrave, Lord
Narvaez, Pamphila de
Nearchus
Pigafetta, Antonio
Ponce de Leon, Juan
Rogers Woods
Vancouver, George

FINE ARTS.

PAINTING.

Air
Battle-piece
Boisseree
Bright
Camaieu, or Cameo
Carmine
Carnation
Chiaro Scuro
Colouring
Cosmorama
Crayons
Design, School of, *s*
Drawing
Eye (Eyes of a portrait)
Encaustic Painting
Flowers, Painting of
Foreshortening
France, (Painting)
Gamboge
German Painting
Glair of Eggs
Glass, Painting on
Giustiniani Collection
Grotesques
Keeping
Limning
Lithochromics
Madonna
Miniature Painting
Mono-chrome
Myriorama
Neorama
Netherlandish School of Painters
Nimbus
Oil Painting
Outline
Pallet
Panorama
Pastel
Pencil
Pencil of Rays
Perspective
Pendant
Pigments
Profile
Purple
Scagliola
Still Life
Tone
Turmeric
Ultramarine
Umber
Vermillion

BIOGRAPHY.
Albani, Francesco
Aberli, John Lewis
Abildgard
Aikman, William
Alberti
Alexander, John
Allan, David
Amberger, Christopher
Angelo, Buonarotti Michael
Appelles
Appiani, Andrew
Appollidorus of Athens
Arpino, Josephino d'
Asseylyn John
Astley, John
Attiret, John Denis
Baan, John Van
Baccio, Della Porta Francisco Bartolomeo
Backerel, William
Backhuysen, Ludolf
Baden, Francis
Balen, Hendrick Van and Jacob Van
Balestra Antonio
Bamboccio. See Laar, Peter Van
Barbarelli, Giorgio. See Giorgione
Barbieri, Giovanni Francisco da Cento. See Guercino
Baroccio, or Barozzi, Frederic
Barezzi, Stefano
Barry, James T.
Bassan
Batoni, Pompeo Girolamo
Beek, David
Bellini, James and his two sons Gentile and Giovanni
Berghem, Nicholas
Berritini Pietro. See Cortona
Bibbiena, Fernando
Bird, Edward
Bloemart Abraham
Bone, Henry, *s*
Bordone, Paris
Both, John and Andrew
Boucher, Francis
Bourdon, Sebastian
Brakenburg, Regner
Branwer, Adrian
Breughel
Bronkhorst, Peter Van
Bronzino, Angelo
Brun, Charles le
Bruyn, Corneille le
Caffe, Daniel
Cagliari, Paul, called Veronese
Calabrese
Calcar, John Van
Caldara, Polidoro
Calvart, Dionysius
Canaletto
Cano Alonzo
Capas, Louis François, *s*
Caravaggio, Michael Angelo Amerghi
Carpi, Girolamo da
Carpi, Ugo da
Carracci, Ludovico, Agostino, and Annibale
Casanova, Francis
Castagno, Andrea del
Cerquozzi, Michael Angelo
Champagne, Philip
Chodowiecki Daniel Nicholas
Cimabue, Giovanni
Cignani, Carlo
Cipriani Giambattista
Claude Lorraine
Copley, John Singleton
Cornelis, Cornelius
Corregio, Antonio Allegri
Cortona, Pietro da
Coypels, the
Coxie, Michael
Crayer, Gaspar
David, Jacques Louis
Delft
Denner, Balthaser
Dietsch, Barbara Regina
Dietrich, John William Ernest
Dolce Carlo
Domenichino
Dorigny
Dosso Dossi
Dow, Gerard
Doyen, Gabriel François
Drouais, John Germain
Dujardin, Charles
Durer, Albert
Edelinck, Gerard
Edmonstone, R. *s*
Edridge, Henry
Elford, Sir William, *s*
Everdingen
Eyck, Hubert and John Van
Fiesole
Floris, Francis
Fresnoy, Charles Alphonso du
Fuger, Frederic Henry
Fuseli, Henry
Fyt, John
Garofalo, Benvenuto
Gell, Sir William
Ghirlandaio, Domenico
Giordano, Luke
Giorgione, Di Castelfranco
Giotto
Girodet, Trioson Nicholas
Giulio, Romano
Goez, Baron of
Guercino
Guido, Reni
Hackert, Philip
Hamilton, Gavin
Heemskerk, Martin Van
Helst, Bartholomew Van der
Hemmling, Hans
Highmore, Joseph
Hogarth, William
Holbein, Hans
Hondekoeter
Honthorst, Gerard
Howe, James, *s*
Huysum, John Van
Jackson, John, *s*
Kaufmann, Angelica
Kneller, Sir Godfrey
Kranach, Lucas
Kuyp, Albert
Laar, Peter Van
Lairesse
Lawrence, Sir Thomas
Lebrun, Charles
Lefevre, Robert
Lely, Sir Peter
Lemoine, Francis
Leseur Eustache
Liverseege, Henry, *s*
Lippi

Lonsdale, James, *s*
Loutherbourg, Philip James
Luke of Leyden
Mabuse, John de
Mantegna, Andrew
Maratti, Carlo
Masaccio
Matsys, Quintin
Mazzola, Francesco
Mecheln, Israel of
Mengs, Anthony Raphael
Merian, Matthew
Metzu Gabriel
Meulen, Anthony Francis Van der
Mieris, Francis
Mignard, Pierre
Mirevelt, Michael Janson
Mola, Peter Francis
Morales, Louis de
Morland, George
Muller, Frederic
Murillo, Bartolomeo Esteban
Nasmyth, Alexander,*s*
Neef, Peter
Neer, Arnold Van der
Netscher, Gaspar
Newton, Gilbert Stuart, *s*
Northcote, James
Ommeganck
Opie, John
Ostade, Adrian Van
Ottley, William Young, *s*
Palma, Giacomo
Palomino, De Valasco
Parrhasius
Peale, Charles Willson
Perugino Pietro Vanucci
Piombo, Sebastiano Del
Poelenburg, Cornelius
Polygnotus of Thasus
Ponte Giacomo de. See Bassan
Pordenone
Porter, Sir Robert Ker
Potter, Paul
Poussin Nicholas
Poussin Gaspar
Preti Mattia. See Calabrese
Primaticcio, Francesco
Protogenes
Prudhon, Pierre Paul
Raeburn, Sir Henry
Ramberg, John Henry
Raphael
Rembrandt, Van Rhyn Paul
Reynolds, Sir Joshua
Ribera Joseph. See Spagnoletto
Roger
Rubens, Peter Paul
Rugendas, George Philip
Runciman, Alexander
Ruysch, Rachel
Ruysdael, James
Sandrart, Joachim Von
Sarto, Andrea del
Sassoferato
Schiavone, Andrea
Schoen, Martin
Schoreel, John
Seidelmann, James
Silhouette
Snyders, Francis
Spagnoletto
Steen, Jan
Steinkopf, John Frederic
Stenwick, Henry
Stewart, Gilbert
Stothard, Thomas, *s*
Tempesta
Teniers, David
Tintoretto
Tischbein
Tisi Benvenuto. See Garofalo
Titian
Tosini Santi. See Fiesole
Vandyck, Anthony
Vanloo
Vannuccul. See Andrea del' Sarto
Vasari, Giorgio
Velasquez
Velde, William Van der, called the Old
Velde, William Van der, called the Younger
Velde, Adrian Van der
Vermeyen, John Van
Veronese Paul. See Cagliari
Vernet
Vinci, Leonardo da
Vouet, Simon
Vroon, Henry Cornelius
Waterloo, Anthony
Watteau, Antoine
Weeinx, John Baptist
Werf, Adrian Van der
West, Benjamin
Wilson, Richard
Wohlgemuth, Michael
Wouvermans, Philip
Wright, Joseph
Zaftleeven, Hermann
Zampieri Domenico. See Domenichino.
Zeuxis

SCULPTURE.

Æginetan Style and Monuments of Art
Alabaster
Antinous
Apollo Belvidere
Arundelian Marbles
Bass Relief
Bust
Cartouch
Chasing
Colossus
Dædalus
Diaglyphon
Elgin Marbles
Gladiatorial Statues
Glyptotheca
Hermes
Laocoon
Marble
Marforio
Myron
Niobe
Statue
Torso

Biography.
Adam
Algardi, Alexander
Angelo, Buonarotti Michael
Archelaus
Bacon, John
Banks, Thomas
Bernini, Giovanni Lorenzo
Bonzaniga, Guiseppe
Bouchardon, Edmund
Cano, Alonzo
Canova, Antonio
Cellini, Benvenuto
Ceracchi, Joseph
Chaudet, Antoine Deins
Coysevox, Antoine
Doll, Frederic William
Donner, George Raphael
Falconet, Stephen Maurice
Finiguerra, Tommaso
Flaxman, John
Girardon, Francis
Ghiberti, Lorenzo
Kellar, John Belthasar
Lysippus
Moitte, Jean Guillaume
Nollekins, Joseph
Nahl, Johann August
Phidias
Pigalle, Jean Baptiste
Pisanus, Nicolaus
Polycletus of Sicyon
Praxiteles
Puget, Pierre
Roubilliac, Louis Francis
Rysbach, John Michael
Sergell, John Tobias
Seroux, L'Agincourt Jean Baptiste
Torrigiano, Pietro
Trippel, Alexander
Zauner, Francis de

HERALDRY.

Argent
Armiger
Armour, Coat of
Baron
Baronets
Blazoning
Cartouch
Coat of Arms
Commandery
Coronet
Courts of Honour
Crest
Crown
Device
Escutcheon
Fleece, Order of the Golden
Fleeces, the Order of the Three Golden
Flower de Lis
Garter, Order of the
George, St
Ghost, Order of the Holy
Hand
Herald
Hubert, Order of St
King at Arms
Knights of the Bath
Mound
Orders, Military
Passant
Peer
Poursuivant
Quarter
Quartering
Rampant
Regardant
Supporters
Thistle, Knights of the
Wreath
For Writers on *Heraldry*, see *Biography* of different countries.

ARCHITECTURE.

Aqueduct
Arcade
Atlantides
Attic Base
Buttresses
Cable
Caisson
Caryatides
Cathedral
Cartouch
Columbarium
Column
Corridor
Conduit
Crypt
Cupola

Cyclopean Work
Echea
Façade
Flutes
Foundation
Frieze
Gallery
Groin
Key
Kiosk
Kiosk Stone
Labyrinth
Listel
Lanthern
Marble
Mausoleum
Metope
Modillion
Module
Nave
Niche
Obelisk
Piazza
Phelloplastics
Propylæa
Portico
Pyramids
Rotunda
Soffita
Stucco
Temple
Triumphal Arch

Biography.
  Adam, Robert
  Alberti, Leon Baptista
  Andronicus of Cyresthes
  Androuet der Cerceau, James
  Angelo, Buonarotti Michael
  Bernini, Giovanni Lorenzo
  Brunelleschi, Philip
  Cano, Alonzo
  Edwards, William, *s*
  Erwin of Steinbach
  Fontana Domenico
  Goodwin, Francis, *s*
  Jones, Inigo
  Lapo, Arnolph
  Mylne, Robert
  Palladio, Andrea
  Piranesi
  Sangallo, Antonio
  Soane, John
  Stuart, James
  Trophonius
  Vanbrugh, Sir John
  Vitruvius, Pollio Marcus
  Wren, Sir Christopher

ENGRAVING.

  [Etching
  Engraving in Lines
  Engraving in Outline
  Steel Engraving
  Stippling
  Aqua Tinto
  Engraving in Mezzotinto
  Etching with soft ground
  Engraving in Wood
  Coloured Engravings
  Engravers, Modern
  Engraving on Precious Stones.]
Aquatinto
Burin
Cast Engravings
Counter Proof
Daguerrotype, *s*
Engraving, *s*
Etching
Impression
Lithography
Siderography
Wood Engraving

Biography.
  Anichini, Luigi
  Bartolozzi Francesco
  Bause, John Frederic
  Bella, Stefano de la
  Bervic, Charles Clement
  Bewick, Thomas, *s*
  Boydell, John
  Callot, Jacques
  Carpi, Ugo Da
  Cellini, Benvenuto
  Chodowiecki, Daniel Nicholas
  Cipriani, Giambattista
  Cochin, Charles Nicholas
  Coney, John, *s*
  Cooke, George, *s*
  Coxie, Michael
  Dorigny
  Durer, Albert
  Earlom, Richard
  Edelinck, Gerard
  Gmelin, William Frederic
  Heath, James, *s*
  Lysons, Rev. Daniel, *s*
  Maratti, Carlo
  Mecheln, Israel of
  Mire, Noel de
  Moreau, Jean Michel
  Morghen, Raphael
  Muller, John Gotthard Von
  Non, Jean Claude Richard de Saint
  Ramberg, John Henry
  Rembrant, van Rhyn Paul
  Sandrart, Joachim Von
  Sennefelder, Aloys
  Volpato, Giovanni
  Waterloo, Anthony
  Wille, John George
  Woollett, William
  Zanetti, Count

POETRY.

Poetics.
  Acrostic
  Adonic
  Alexandrine
  Alliteration
  Anagrams
  Asclepedean Verse
  Assonance
  Assonant Rhymés
  Ballad
  Bard
  Bouts Rimes
  Cæsura
  Cento
  Charade
  Choriamb
  Didactic Poetry
  Distich
  Eclogue
  Elegy
  Endecasyllables
  Epic
  Epigram
  Episode
  Epode
  Fescinine Verses
  Foot
  Heroical Epistle
  Hexameter
  Hiatus
  Hymn
  Iambus
  Improvisatori
  Ionic Foot
  Lay
  Leonine Verse
  Lyrics
  Macaroni Poems
  Madrigal
  Minstrel
  Monogram
  Ode
  Palindromon
  Parody
  Pastoral
  Pentameter
  Provençal Poets
  Quatrain
  Redondillas
  Rhapsody
  Rhyme
  Rhythm
  Satire
  Scanning
  Seguidilla
  Sestina
  Sonnet
  Spondee
  Stanza
  Strophe
  Threnody
  Travesty
  Triolett
  Troubadours
  Verse
  See *Hieroglyphics*, *Mythology*, and *Rhetoric*.
  See *Poets*, under the *Biography* of different countries.

Drama.
  Actor
  Atellanæ Fabulæ
  Burletta
  Buskin
  Chorus
  Comedy
  Didascalia
  Dialogue
  Dramaturgy
  Epilogue
  Farce
  Histriones
  Harlequin
  Interlude
  Masks
  Masque
  Melo-drama
  Mimes
  Monodrama
  Monologue
  Morality
  Mysteries
  Opera
  Oratorio
  Pagliajo
  Pantalone
  Pantomime
  Prologue
  Proscenium
  Punchinello
  Scaramouch
  Scenery
  Sock
  Soliloquy
  Soubrette
  Termagaunt
  Theatre
  Thespis
  Tragedy
  Trilogy
  See *Poetry*.
  See *Dramatic Writers* and *Actors* under the *Biography* of different countries.

MUSIC.

Music, *s*
Musical Compositions.
  Accompaniment
  Air
  Bravura
  Cantata
  Canzonet
  Cavatina
  Chorus
  Concert
  Concerto
  Fanfare
  Fantasia
  Finale
  Flourish
  Fugue
  Glee
  Instrumental Music
  March
  Melody
  Music, *s*
  Oratorio

Orchestra
Overture
Pastorale
Piano
Plain Song
Polonaise
Quartetto
Quintetto
Ritornello
Rondo
Russian Hunting Music
Scherzo
Serenade
Singing
Solo
Symphony
Te Deum Laudamus
Theme
Trill
Trio
Vocal Music

Musical Instruments.

Æolian Harp
Apollonicon
Bagpipe
Basset Horn
Bassoon
Bass Viol
Bow
Bow Instruments
Calamus
Chimes
Clarichord
Clarinet
Cornet
Cymbals
Drum
Fife
Flageolet
Flute
Gong
Guitar
Harp
Harpsichord
Hautboy
Horn, or Bugle Horn
Hydraulicon
Instrument
Jew's Harp
Lute
Lyre
Organ
Pedals
Piano Forte
Pitch-pipe
Psaltery
Sacbut
Spinet
Syrinx
Tambourine
Terpodion
Theorbo
Tibia
Trombone
Trumpet
Tuba
Tympanum
Viol
Violin
Violoncello
Violino

Musical Terms.

Adagio
Ad libitum
A la mi re
Alla Breve
Allegro
Alt
Alto, or Alto Tenore
Amati
Andante
Appogiatura
Appogiato
A Tempo
Attacca
Bariton
Bass
Breve
C.
Cadence
Caldara
Canon
Capriccio
Catgut
Choral
Chord
Chromatic
Clavicimbatum
Cliffs, or Cleves
Come Sopra
Come Sta
Concord
Conservatory
Consonance
Counterpoint
Crescendo
Da Capo
Dal Segno
Decrescendo
Diapason
Diatonic
Diatonum Intensum
Discord
Dissonance
Enharmonic
False
Falsetto
Fifth
Finger Board
Fingering
Flat
Fourteenth
Fourth
Frets
Fundamental Note
Gamut
Grave
Harmonica
Harmony
Harmony, Figured
Heptachord
Hexachord
Interval
Intonation
Key Note
Keys
La
Legato
Leger Lines
L'Intesso Tempo
Major
Mancando
Mandola
Men
Messe Concertate
Messe di Capella
Messa di Voce
Mesto
Mezzo
Mi
Minim
Mode
Modulation
Molle
Molto
Monochord
Motet
Ninth
Notes
Obligato
Octave
Piano
Pizzicato
Piu
Point
Postamento di Voce
Recitative
Recognizance
Scale
Segno
Sestetto
Sharp
Sistrum
Solfaing
Soprano
Sordino
Staccato
Stop
Stretto
Tablature
Tempo
Tenor
Tetrachord
Thorough Bass
Time
Timoroso
Tirade
Tone
Tonic
Triad Harmonic
Tutti
Unison
Ut Re Mi
Va
Variation
Voice

Biography.

Aldrich, Henry
Allegri, Gregorio
Anfossi, Pasquale
Aretino, Guido
Ariosti, Attilio
Arne, Thomas Augustin
Arnold, Dr Samuel
Bach, John Sebastian
Balalaika
Beethoven, Louis Von
Benda, George
Beriot, Madame Malibran de, *s*
Boccherini, Luigi
Boyce, William
Burney, Charles
Calvisius, Seth
Carissimi, Giacomo
Cimarosa, Domenico
Clementi, Musio
Corelli, Arcangelo
Davies, Cecilia, *s*
Della, Maria Dominique
Denner, John Christian
Ditters von Dittersdorf, Charles
Durante, Francesco
Farinelli
Fux, John Joseph
Gallupi, Baldessaro
Gluck, the Chevalier
Gossec, Francis Joseph
Graun, Charles Henry
Gretry, Andre Ernest Modeste
Guglielmi, Peter
Handel, George Frederick
Hasse, John Adolphus
Haydn, Joseph
Himmel, Frederic Henry
Homilius, Godfrey Augustus
Incledon, Benjamin Charles
Jackson, William
Jomelli Nicolo
Josquin de Prez Adrian
Keiser
Lasso, Orlando di
Leo, Leonardo
Lesueur, Jean Baptiste
Linus
Lolli, Antonio
Lully, Jean Baptiste
Majorano, Gaetano
Manelli, Pietro
Mara, Gertrude Elisabeth
Marcello, Benedetto
Marchesi, Luigi
Marpurg, Frederic William
Martini, John Baptist
Mayer, Simon
Mehul, Stephen Henry
Mingotti, Catharine
Monsigny, Pierre Alexandre
Mozart
Naldi, Sebastiano
Nardini, Pietro
Naumann, John Gottlieb
Neukomm, Sigismund
Nicolo
Paesiello, Giovanni
Palestrina, Giovanni Pietro Aloisio
Philidor, Andrew
Piccini, Nicolo
Porporo, Nicolo
Purcell, Henry
Quantz, John Joachim
Rameau, Jean Philippe
Reichardt, John Frederic
Sacchini
Salieri, Anthony
Sarti, Joseph
Scarlatti, Allessandro
Schicht, John Gottfried
Staner, Jacob
Stein, John Andrew
Tartini, Guiseppe
Telemann, Gio. Philip

- Viotti, Giovanni Battista
- Vogler, George Joseph
- Weber, Charles Maria Von
- Weber, Godfrey
- Wieland, Christ. Martin
- Winter, Peter Von
- Wolfe, Joseph
- Zarlino, Guiseppe
- Zingarelli, Nicolo
- Zumsteeg, John Redolphus

MISCELLANEOUS.

- Antique
- Arabesque
- Byzantine School of Art
- Cameo, or Camaieu
- Canon
- Caricature
- Cartoon
- Cast
- Costume
- Cramp
- Death, Dance of
- Dilettanti
- Drawing
- Emblem
- Embossing
- Ensemble
- Etruria
- Excavations
- Faux Jour
- Fresco Painting
- Gem Sculpture
- German School of Art
- Group
- Iconography
- Ideal
- Manner
- Model
- Mosaics
- Murrine Vases
- Museum
- National Gallery
- Nudity
- Pictures, Living
- Pitturesque
- Plastic
- Portland Vase
- Relievo
- Restoration

Biography.
- Aldobrandini
- Angerstein, John Julius
- Artemisia
- Berry, William
- Cellini Benvenuto
- Crozat, Joseph Antony
- Denon, Baron de
- Egremont, Earl of, *s*
- Fresnoy, Charles Alphonso du
- Gell, Sir William, *s*
- Howard, Thomas, Earl of Arundel
- Kent, William
- Knight, Richard Payne
- Lanzi Luigi
- Medici
- Piranesi
- Tischbien
- Townley, Charles
- Vasari, Giorgio
- Visconti, John Baptist Anthony
- Visconti, Ennius Quirinus
- Watelet, Claude Henry
- Wood, Robert

GRAMMAR, METAPHYSICS, AND MATHEMATICS.

I.

GRAMMAR.

Language.
- [Written Language
- Spoken Language
- Origin and Formation of Language
- Primitive Tongue]
- Voice
- Vowel
- Consonant
- Aspirate
- Accent
- Syllable
- Dialect
- Semitic Languages
- Romanic Languages
- Sanscrit
- Guttural
- Euphony
- Cacophony
- Style
- Synonymes
- Prose
- Tautology
- Pathos
- Bombast
- Burlesque
- Archaism
- Anacoluthon
- Onomatopæia

Hieroglyphics.
- Egyptian Hieroglyphics
- Hieroglyphic
- Hieratic
- Demotic
- Pure Hieroglyphics
- Numeration by Hieroglyphics
- Ideographic
- Denderah
- Rosetta Stone
- Horapolla
- See *Writing*.

Writing
- Alphabet
- Demotic Alphabet
- Runic Alphabet and Words
- Autographs
- Autography
- Isography
- Phonetic
- Pasigraphy
- Quipos
- Apograph
- Art of Deciphering
- Pen
- Manuscripts
- Manuscripts, Illuminated
- Materials
- Monograph
- Vellum
- Dyptycha
- Punctuation.
- See *Hieroglyphics*.

Typography.
- Asterisk
- Correction of the Press
- Crapelet
- Form, Printers'
- Fount
- Signature
- Minion
- Nonpareil
- Primer
- Printing
- Quadrat
- Revise
- Signature
- Stereotype
- Typography

Typographers.
- Ballantyne, James
- Barbon
- Baskerville, John
- Bodini, Giambatista
- Bowyer, William
- Breitkopf, John Gotlob Emanuel
- Caxton, William
- Coster, Laurens
- Didot
- Elzevir
- Faust, John
- Froben, John
- Giunti
- Guttenberg, John
- Ibarra, Joachim
- Manutius, Aldus
- Stephens

Grammar.
- Article
- Noun
- Pronoun
- Object
- Verb
- Indicative
- Imperative
- Infinitive
- Participle
- Particles
- Preposition
- Dual
- Amphibology
- Orthography
- Etymology
- Syntax
- Prosody
- Punctuation
- Period
- Ellipsis
- Solecism
- Anomaly
- Diminutive
- See *Language*, &c.

Biography.
- Adam, Alexander
- Adam, Nicholas
- Apollodorus
- Philo of Biblos

Rhetoric.
- Topics
- Metaphor
- Trope

METONOMY.
- Apostrophe
- Antithesis
- Antiphrasis
- Synecdoche
- Pleonasm
- Amplification
- Climax
- Personification
- Paranomasia
- Antanaclasis
- Asyndeton
- Assonance
- Anaphora
- Epiphora
- Concetti
- Allegory
- Rhetoricians and Grammarians
- See *Grammar* and *Poetry*.

LOGIC.
- Thesis
- Synthesis
- Induction
- Major
- Syllogism
- Category
- Argumentum ad hominem
- Epichirema
- Paralogism
- Dilemma
- Circle
- Petitio Principii
- Sophism
- Sorites
- Concrete
- Dialectics
- Quantity and Quality

PHILOLOGY.
- A
- Abbreviations
- Alma
- Anagram
- Analogy
- Arch
- Archaism
- B
- C
- Character
- Collation
- Comfortable
- Crypto
- D
- Definition
- Dictionary
- Digraph
- Dun
- E
- Encyclopedia
- Epi
- Es
- F
- G
- Gar
- Gloss
- H
- Haff
- Hain
- Home
- I
- Idiot
- Idioticon
- Indians
- Intenseness
- Inversion
- Irony
- J
- K
- Kamen
- Kara
- Karl
- Kebir
- Keang
- Kirche
- Kirke
- Klein
- Kœnig
- Koh
- Kottah
- Kourd
- Kremel
- L
- Language
- Logos
- Lon
- M
- May
- Melas
- Meta
- Minster
- N
- Naivette
- Neologism
- Nees
- Neu
- O
- Omega
- P
- Philology
- Pseudo
- Pun
- Q
- R
- S
- Scholia
- T
- Tramontana
- U
- V
- Various Readings
- W
- Writing
- X
- Y
- Z

BIOGRAPHY.
- Ainsworth, Robert
- Aler, Paul
- Alter, Francis Charles
- Bos, Lamberti
- Casaubon, Isaac de
- Cellarius, Christopher
- Damarsais, Cæsar Chesneau
- Forcellini, Egidio
- Gronovius
- Harris, James
- Havercamp
- Heinsius, Daniel
- Heinsius, Nicholas
- Hemsterhuis, Tiberius
- Kopf
- Scaliger, Julius Cæsar
- Scaliger, Joseph Justus
- Schneider, John Gotlob
- Schweighaeuser, John
- Spohn, Frederic Augustus William
- Vossius, Gerard John
- Vossius, Isaac
- Valla, Laurence
- Valckenaer, Louis Caspar
- Walker, John

II.

METAPHYSICS.

THEOLOGY.
- Accommodation
- Angel
- Assurance
- Atheism
- Baptism
- Baptism of Blood
- Baptism by Fire
- Blasphemy
- Calvinism
- Calvinists
- Crypto
- Deism
- Demon
- Dogmas, History of
- Dogmatics
- Freethinker
- Hierarchy
- Immortality
- Logos
- Lord's Supper
- Magians
- Mediator
- Monotheism
- Mysticism
- Ontological Proof
- Pantheism
- Patristics
- Pelagianism
- Polytheism
- Preadamites
- Religion
- Resurrection
- Revelation
- Sin
- Supernaturalism
- Theocracy
- Theodocæa
- Theogony
- Theomancy
- Theosophy
- Trinity
- Type
- Worship of God

BIOGRAPHY.
- Diodati, John
- Paine, Thomas
- Paley, William
- Pastorale

BIBLE.
- Abel
- Abraham
- Acts of the Apostles
- Aceldama
- Adam
- Adonai
- Ahasuerus
- Ahitophel
- Ajalon
- Alexandrian Copy
- Alpha and Omega
- Amos
- Anagogy
- Apocalypse
- Apocrypha
- Apocryphal
- Argentus Codex
- Ark
- Athaliah
- Augean Codex
- Bartholomew
- Belial
- Biblical Archæology
- Bibliomancy
- Caiphas
- Cain
- Caleb
- Cambridge Manuscript
- Canon
- Caraites
- Catholic Epistles
- Cherub
- Concordance
- Daniel
- David
- Decalogue
- Deluge
- Deuteronomy
- Ebenezer
- Elijah
- Enoch
- Enos
- Esther
- Exegesis
- Ezekiel

- Gabriel
- Genesis
- Gideon
- Gog and Magog
- Gospel
- Habakkuk
- Hagar
- Haggai
- Hagiographia
- Halleluja
- Harmony
- Heptateuch
- Hexapla
- Hosea
- Isaac
- Isaiah
- Jacob
- James, St
- Japheth
- Jared
- Jephthah
- Jeremiah
- Jesse
- Joab
- Job
- Joel
- John the Baptist
- John the Evangelist
- Jonah
- Joseph
- Judas
- Judith
- Lazarus
- Levi
- Luke
- Malachi
- Manasseh
- Mark the Evangelist
- Mary
- Masora
- Matthew
- Melchizedeck
- Melita
- Micah
- Michael
- Midianites
- Miriam
- Moab
- Moses
- Nahum
- Nazarites
- Nehemiah
- Nicodemus
- Nimrod
- Noah
- Obadiah
- Og
- Ophir
- Paraclite
- Paradise
- Paul
- Pentapla
- Peter the Apostle
- Philistines
- Pontius
- Polyglot
- Prophets
- Psalm
- Samson
- Samuel
- Saul
- Septuagint
- Shem
- Simon Magus
- Sirach
- Societies
- Solomon
- Solomon's Song
- Targum
- Testament, Old and New
- Tectrapala
- Thomas, St
- Timothy
- Titus
- Tobit
- Vulgate
- Zechariah

Biography.

Biblical Commentators.
- Ainsworth, Dr Henry
- Alexander, Noel
- Calmet, Augustine
- Clarke, Adam
- Cunstein, C. H. Von
- Griesbach, John James
- Henry, Matthew
- Kennicott, Dr
- Leusden, John
- Macknight, James
- Messier, Charles
- Prideaux, Humphrey

Metaphysics.
- Anima Mundi
- Anthropology
- Atoms
- Axiom
- Demon
- Dualism
- Emanation
- Endæmonism
- Esoteric
- Genius
- Gnostics
- Idealism
- Imagination
- Immortality
- Innate Ideas
- Intuition
- Materialism
- Matter
- Memory
- Modality
- Mental Æsthetic
- Mental Analysis
- Method
- Negative
- Necessity
- Object
- Occasional Causes
- Ontology
- Optimism
- Perfectability
- Peripatetic
- Probabilists
- Probability
- Psychology
- Real
- Scholastic
- Scholastics
- Soul
- Spiritualism
- Subject
- Substance
- Teleology
- Theory
- Transcendant and Transcendental
- Transmigration of the Soul
- Type
- Universal
- Will
- Wit

Biography.

Metaphysics.
- Hartley, David
- Helvetius, Claude
- Adrian
- Hobbes, Thomas
- Hutcheson, Francis
- Locke, John
- Reid, Thomas
- Stewart, Dugald
- Tucker, Abraham

Scholastic Philosophy.
- Bardesanes
- Berengarius
- Berkely, Dr George
- Bonaventura, John
- Brown, Dr Thomas
- Bruno, Giordano
- Campanella, Thomas
- Cardan, Geronium
- Duns, John
- Erigena, John Scotus
- Eyck, John Van
- Hales, Alexander de
- Jamblichus
- Lully, Raymond
- Malebranche, Nicholas
- Occam, William
- Ophites
- Plotinus
- Porphyry
- Posidonius

III.

MATHEMATICS.

Mathematics.
- Analysis
- Apparent
- Approximation
- Asymptote
- Calculus
- Chance
- Circle
- Combination
- Compasses
- Cone
- Cycloid
- Decimal Measure
- Dial, Sun
- Diameter
- Ellipsis
- Evolvents
- Exponents
- Frustrum
- Functions
- Generated
- Genesis
- Given
- Gunter's Quadrant
- Inclination
- Incommensurable
- Inflexion, point of
- Involution
- Irrational Quantities
- Lemma
- Limb
- Line, Mathematical
- Limit
- Magnitude, Apparent
- Maximum
- Mean
- Negative
- Orthographic Projection
- Parabola
- Parallax
- Parallelism
- Parallel Lines
- Parallelogram of Forces
- Plus
- Polyhedron
- Postulate
- Proportion
- Rectangular Figures and Solids
- Scale
- Series
- Sine
- Solid Angle
- Sphere
- Spheroid
- Table
- Tangent
- Transcendent and Transcendental
- Variations, Calculus of

Arithmetic.
- [Binary Scale
- Tetractys of Pythagoras
- Roman Numerals
- Digital Arithmetic

  - Arabic Digits
  - European Numerals
  - Arabian Computation
  - Chinese Computation
  - Calculating Machines.]
- Abacus
- Aliquot part
- Alligation
- Calculus
- Ciphers
- Cube
- Decimals
- Digit
- Equation of Payments
- Factor
- Fellowship
- Figural Numbers
- Fractions
- Gunter's Line
- Interest
- Logarithms
- Multiple
- Notation
- Numerator
- Prime Numbers
- Quotient
- Power
- Progression
- Rule of Three
- Sexagesimals

ALGEBRA.

- Analysis
- Binomial Theorem
- Coefficients
- Cube
- Cube Root
- Degree
- Equation
- Interpolation
- Resolution
- Power
- Root
- Surd
- Sursolid

GEOMETRY.

  - [Definitions
  - Properties of Lines
  - Properties of Triangles
  - Properties of Quadrilaterals, &c.
  - Properties of Circles, &c.
  - Geometry of Planes
  - Geometry of Solids.]
- Almagest
- Altitude
- Angle
- Archimedes
- Area
- Axis
- Catenary
- Commensurable
- Cube
- Curves
- Cylinder
- Degree
- Diagonal
- Diagram
- Epicycloid
- Exhaustion
- Globe
- Goniometer
- Heights, Measurement of
- Octagon
- Octahedron
- Parallelopiped
- Perimeter
- Perpendicular
- Planimetry
- Points
- Prism
- Progression
- Pyramid
- Quadrature
- Quindecagon
- Spiral
- Square
- Stereometry
- Subtangent
- Subtense
- Supplement
- Surveying
- Tetraedron
- Tetragon
- Triangle
- Triangular Compasses
- Triangulating
- Variable Quantities
- Variation of Curvature

TRIGONOMETRY.

- Circular Parts
- Secant
- Sine
- Triangulating

Biography.

MATHEMATICS.

- Allen, Thomas
- Anderson, Alexander
- Appolonius of Perga
- Attwood, George
- Baker, Thomas
- Behaim, Martin
- Bernouilli
- Blair, John
- Bonnycastle, John
- Borda, Jean Charles
- Bugge, Thomas
- Chastelet, Marquis de
- Condorcet, Marquis de
- Craig, John
- Crousaz, John Peter de
- Demoivre, Abraham
- Descartes, Rene
- Doppelmayr, John Gabriel
- Dupuis, Charles François
- Emerson, William
- Euclid
- Euler, Leonard
- Gehler, John Samuel Traugott
- Godfrey, Thomas
- Gregory, David
- Gregory, James
- Gunter, Edmund
- Hadley, John
- Halley, Edmund
- Hopital, William Francis Anthony de l'
- Hutton, Charles
- Huygens, Christian
- Kæstner, Abraham Gotthelf
- Kepler, John
- Leibnitz, Gottfried Wilhelm
- Lagrange, Joseph Louis
- Lambert, John Henry
- Laplace, Marquis de
- Maclaurin, Colin
- Manfredi, Eustachio
- Maseres, Francis
- Maupertius
- Mercator, Gerard
- Meto
- Molyneux, William
- Monge, Gaspar
- Montucla, John Stephen
- Napier, John
- Newton, Sir Isaac
- Playfair, John
- Ptolemy
- Ramsden
- Reichenbach, George of
- Saunderson, Nicholas
- S'gravesande, William James Van
- Simpson, Thomas
- Simson, Robert
- Toaldo, Giuseppe
- Tschirnhausen, Ehrenfried Walter Von
- Ulloa, Don Antonio di
- Vega, Baron de
- Viviani, Vincent
- Wallis, John

NATURAL PHILOSOPHY.

I.

NATURAL PHILOSOPHY.

- Adhesion
- Air
- Air-Gun
- Air-Pipe
- Air-Pump
- Artesian Wells, *s*
- Asphalte, *s*
- Atmosphere
- Attraction
- Avalanches
- Camsin, *s*
- Capillary Tubes
- Climate
- Cohesion
- Combustion
- Comets
- Compressibility
- Currents
- Dew
- Drosometer
- Dry Rot
- Elasticity
- Electricity
- Experimental Philosophy
- Explosion
- Extension
- Fairy Circle
- Fall of Bodies
- Filtration of Water, *s*
- Fire
- Flame
- Fluid
- Fluids, Motion of
- Fog
- Freezing
- Frost
- Fuel
- Glaciers
- Gravity
- Hail
- Harmadan
- High Water
- Hydrodynamics
- Hydrometer
- Hydrostatics
- Ice
- Ignition
- Light

Mascaret
Meteorology
Microscope, *s*
Mobility
Motion
Neap Tides
Night
Philosophy Natural
Phosphorescence
Porosity
Projectile
Pyrometer
Rain-guage
Reverberation
Seasons
Siphon
Snow
Solid
Sound
Spring
Spring Tide
Springs
Steam
Summer
Temperature
Tides
Thermometer
Thunder and Lightning
Thunderbolt
Twilight
Vacuum
Vesuvius
Volcanoes
Volume
Wave
Whirlpool
Whirlwinds
Wind
Winter
Zephyr

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- Anderson, John, F.R.S.
- Bergmann, Torbern Olof
- Boyle, Robert
- Brugmans, Sebald Justinus
- Colden, Cadwallader
- Condamine, Charles Marie la
- Conti, Antoine Schinella
- Fontana, Felice
- Galileo
- Gassendi, Peter
- Guericke, Otto Von
- Hooke, Robert
- Leslie, Sir John
- Leuwenhoek, Anthony
- Lichtenberg, George Christopher
- Marsigli, Count of
- Musschenbroek, Peter Van
- Newton, Sir Isaac
- Nicholson, William
- Nollet, John Antoine
- Playfair, John
- Priestley, Joseph
- Reaumur, Rene Antoine Ferchault de
- Robison, Dr John
- Rumford, Count
- Saussure, Horace Benedict de
- Seebeck

II.

NATURAL HISTORY.

PHYSIOLOGY

Adam's Apple
Albinos
Albumen
Ambergris
Amman
Anatomy
[Anatomical Preparations]
Animal
Animal Life
Animal Heat
Animal Matter
Antagonist Muscles
Antipathy
Aorta
Aselli
Beard
Bile
Birth
Blood
Bone
Brain
Breadth
Calculus or Stone
Capillary Vessels
Cartilage
Castrates
Catamenia
Cellular Substance, or Cellular Membrane
Chest
Chyme
Complexion
Comparative Anatomy
Concretions, Morbid
Congestion
Constitution
Consumption
Contagion
Convulsion
Corn
Corpulence
Corset
Cough
Cuticle
Death
Diaphragm
Digestion
Dormant State of Animals
Drowning
Dyspepsia
Dwarfs
Ear, and *s*
Egg
Embryo
Epigastric
Epiglottis
Extremities
Eyelid
Face
Fallopian Tubes
Fasting
Fat of Animals
Feeling
Fibrin
Flesh
Freckles
Fruitfulness
Functions
Gall-Bladder
Gall-Stones
Gastric Juice
Gastric System
Hardness
Harelip
Hair
Head
Health
Heart
Hermaphrodite
Horn
Hunger
Hypochondriasis, and Hysteria, *s*
Idiosyncrasy
Incubation
Incubus
Intestine
Irritability
Kidney
Lethargy
Liver
Lungs
Lymph
Mesentery
Milk
Monsters
Mucus
Muscle
Muscular Motion
Natural State of Man
Negro
Nerves
Nose
Organology
Ovary
Period
Perspiration
Phrenology
Physiology
Pia Mater
Picromel
Pregnancy
Puberty
Pulse
Quadruped
Quarteroons
Respiration
Saliva
Secretion
Seed
Senses
Sex
Siamese Twins
Sleep
Skin
Smell
Somnambulism
Somnus
Sneezing
Spawning of Fish
Spleen
Stomach
Stuttering
Suffocation
Sympathy
Taste
Tear
Teeth
Temperaments
Thirst
Tongue
Twin
Urine
Uterus
Vertebra
Vessels
Voice
Wart
Whalebone
Windpipe
Woman
Wrinkles
Wrist
Yawning
Zoology
Zoophyte

ANIMAL KINGDOM.

MAN.
- Albanos
- [See article *Man* for the varieties of the human race.]

QUADRUPEDS.
- Aguti

- Ape
- Ant Eater
- Antelope
- Argali
- Armadillo
- Ass
- Baboon
- Badger
- Bat
- Beagle
- Bear
- Beaver
- Bison
- Bloodhound
- Buffalo
- Bull Dog
- Camel
- Camelopard
- Cashmere Goat
- Cat
- Chamois
- Chinchilla *s*
- Civet
- Deer
  - [Moose Deer
  - Rein Deer
  - American Elk
  - Black Tailed Deer
  - Long Tailed Deer
  - Mexican Deer]
- Elephant
- Ermine
- Fauna
- Ferret
- Fox
  - [Arctic Fox
  - Black Fox
  - Red Fox
  - Crossed Fox
  - Gray Fox
  - Swift Fox]
- Glutton
- Gnu
- Goat
- Goatsucker
- Greyhound
- Guinea Pig
- Hare
- Hedgehog
- Hippopotamus
- Hog
  - [Common Hog
  - Wild Boar
  - Guinea Hog
  - Babyroussa]
- Horse
- Hound
- Hyæna
- Ichneumon
- Ibex
- Jackal
- Jaguar
- Jerboa
- Jumping Mouse
- Kangaroo
- Lanigera
- Llama
- Lemming
- Lemur
- Leopard
- Lion
- Lynx
- Manakin
- Marmot
- Marsupials
- Mastiff
- Mink
- Mole
- Monkey
- Mouse
- Mule
- Musk
- Musk Ox
- Nyl Ghau
- Opossum
- Otter
- Ox
- Paca
- Panther
- Porcupine
- Puma
- Quadrupeds
- Quagga
- Rabbit
- Racoon
- Rat
- Ratel
- Rhinoceros
- Sheep
- Shepherd's Dog
- Shrew Mole
- Sloth
- Spaniel
- Squirrel
- Tapir
- Tiger
- Tortoise
- Turnspit
- Vampire
- Weasel
- Weevil
- Wolf
- Birds.
  - Albatross
  - Baltimore Bird
  - Barnacle
  - Blackbird
  - Blue Bird
  - Bustard
  - Buzzard
  - Carrier Pigeon, and *s*
  - Cassowary
  - Cat Bird
  - Chough
  - Cock
  - Condor
  - Cormorant
  - Crow
  - Cuckoo
  - Curlew
  - Duck
  - Eagle
  - Eider Duck
  - Finch
    - [Goldfinch
    - Canary
    - Linnet, &c.]
  - Flamingo
  - Flycatcher
  - Gannet
  - Goose
    - [Snow Goose
    - Laughing Goose
    - Bean Goose
    - Canada Goose, &c.]
  - Goshawk
  - Grosebeak
  - Grouse
    - [Wood Grouse
    - Black Grouse
    - Red Grouse
    - White Grouse
    - Pinnated Grouse
    - Ruffled Grouse, &c.]
  - Gull
  - Hawk
  - Heron
  - Humming Bird
  - Ibis
  - Igauna
  - Indicator
  - Jacamar
  - Jackdaw
  - Jay
  - King Fisher
  - Lady Bird
  - Lapwing
  - Lark
    - [Sky Lark
    - Wood Lark
    - Shore Lark
    - Brown Lark
    - Meadow Lark, &c.]
  - Loon
  - Lory
  - Lyre Bird
  - Macaw
  - Magpie
  - Marten
  - Mocking Bird
  - Motmot
  - Night Hawk
  - Nightingale
  - Nuthatch
  - Oriole
  - Ortolan
  - Ostrich
  - Owl
  - Paradise, Bird of
  - Parrot
  - Peacock
  - Pelican
  - Petrel
  - Phalarope
  - Pheasant
  - Pigeon
  - Pinguin
  - Platypus
  - Plover
  - Puffin
  - Quail
  - Redbreast
  - Rice Bunting
  - Robin, American
  - Roller
  - Ruff
  - Sandpiper
  - Snipe
  - Snow Bird
  - Sparrow
  - Sparrow Hawk
  - Starling
  - Stork
  - Swallow
    - [Barn Swallow
    - White-bellied Swallow
    - Purple Marten
    - Bank Swallow
    - Cliff Swallow
    - Chimney Swallow]
  - Swan
  - Teal
  - Thrush
  - Titmouse
  - Toucan
  - Trumpeter
  - Turkey
  - Turtle Dove
  - Vulture
  - Wag Tail
  - Whip-Poor-Will
  - Widgeon
  - Woodpecker
  - Wren
  - Wry Neck
  - Yellow Bird
- Fishes.
  - Anchovy
  - Black Fish
  - Carp
  - Cod
  - Crab
  - Devil Fish
  - Dog Fish
  - Dolphin
  - Dory, John
  - Eel
  - Electrical Eel
  - Flying Fish
  - Frog Fish
  - Gar Fish
  - Goby
  - Gold Fish, and *s*
  - Gudgeon
  - Gurnard
  - Haddock
  - Hake
  - Hermit Crab
  - Herring
  - Holibut
  - King Crab
  - Lamprey
  - Lasher
  - Ling
  - Lobster
  - Lump Fish
  - Mackerel
  - Minnow
  - Mullet
  - Multivalves
  - Narwhal
  - Ostracion
  - Oyster
  - Pilchard
  - Pike
  - Porpoise
  - Ray
  - Salmon
  - Saw Fish
  - Sea Horse
  - Seal
  - Sepia
  - Shad
  - Shark
  - Shrimp
  - Skunk
  - Smelt
  - Sole
  - Sprat
  - Sturgeon
  - Sun Fish
  - Sword Fish
  - Tench
  - Torpedo
  - Trout
  - Tunny
  - Turbot
  - Walrus
  - Whale
  - Whiting
- Insects.
  - Ant
  - Bee, and *s*

Beetle
Coccus
Cock Chaffer
Cock Roach
Cricket
Crustacea
Earwig
East India Fly
Elater
Entomology
Ephemera
Fire Fly
Flesh Fly, *s*
Fly
Gall Fly
Gnat
Gossamer
Lantern Fly
Locust
Louse
Mantis
Meloe
Mite
Mole Cricket
Moth
Myriapoda
Œstrus
Papilio
Spider
Termites
Tick
Wasp
REPTILES AND WORMS.
Alligator
Amphisbæna
Animalcula
Asp
Basilisk
Boa
Chameleon
Cobra Da Capella
Crocodile
Centipede
Gecko
Glow-worm
Leech
Lizard
Megalosaurus
Monitor
Polypi
Rana
Rattle-snake
Scorpion
Sea Serpent
Serpent
Serpent Eater
Salamander
Tadpole
Tape-worm
Toad
Venomous Animals
Worm
FABULOUS AND NON-EXISTING ANIMALS.
Dragon
Kraken
Leviathan
Megatherium
Mammoth
Mastodon
Salamander
Unicorn
Troglodytes
MISCELLANEOUS.
Amphibia
Angling
Animal
Animal Life
Antennæ
Aviary
Bird-Catching
Conchology
Coral, and *s*
Echinodermata
Echinus
Entomology, *s*
Exuviæ
Fascination
Feathers, and *s*
Fin
Flying
Gall
Gallinæ
Generical Name
Giants
Horn
Ichthyology
Incubation
Insectivora
Instinct
Lac
Malacology
Mammalia
Mastology
Merganser
Microscope, *s*
Migration of Animals
Mollusca
Morphology
Mouth
Nest
Orders
Organic Remains
Ornithology
Palingenesy
Pearl
Phosphorescence
Pip
Ruminant
Silk
Sponge
Stemmata
Tunicata
Variety
Wing
Zoolithes
Zoology
Zoophite
BIOGRAPHY.
Adamson, Michael
Aldred
Aldrovandus, Ulysses
Artedi, Peter
Audebert, Jean Baptiste
Banks, Sir Joseph
Bloch, Marcus Eliezer
Bonnet, Charles
Buffon, George Louis Leclerc, Count of
Cazwini, Zacharia Ben Mahommed
Cuvier, Baron
Daubenton, Louis Jean Marie
Ellis, John
Fabricius, John Christian
Forster, John George Adam
Forster, John Reinhold
Godman, John D.
Humboldt, Frederic Henry Alexander
Ingenhouss, John
Lacepede, Count Delaville sur Illon de
Lamarck, Chevalier de
Linné, Charles
Lyonnet, Peter
Neuwied, Prince
Niebuhr, Carstens
Olivier, Guillaume Antoine
Pallas, Peter Simon
Pennant, Thomas
Peron, François
Pictet, Marcus Augustus
Pliny the Elder
Palisot de Beauvais
Ray, John
Sloane, Sir Hans
Soemmering, Samuel Thomas Von
Spallanzani, Lazarus
Sparrman, Andrew
Spix, John Baptist Von
Swammerdam, John

VEGETABLE KINGDOM.

BOTANY.
Fructification.
Flower
Leaf
Nectary
Pericarpium
Petal
Receptacle
Seed
BLOSSOMS.
Amaranth
Anemone
Dahlia, and *s*
Daisy
Dragon's Blood
Eglantine
Forget-me-not
Geranium
Gloriosa Superba
Holly
Hollyhock
Honeysuckle
Hyacinth
Iris
Ladies' Slipper
Larkspur
Lily
Lotus
Lupine
Magnolia
Narcissus
Pœony
Passion Flower
Pink
Poppy
Primrose
Ranunculus
Rose
Rose, Acacia
Rose of Jericho
Shepherd's Purse
Skull Cap
Star of Bethlehem
Sun-dew
Sun-flower
Sweet William
Tiger Flower
Tulip
Violet
Wall Flower
Water Lily
FRUITS.
Citron
Gourd
Lemon
Medlar
Melon
Mulberry
Orange
Peach
Pear
Plum
Pomegranate
Prickly Pear
Pumpkin
Quince
Raspberry
Shaddock
TREES AND WOODS.
Alburnum
Alder
Almond Tree
Aloe
Ash
Aspen
Betel
Broom
Cabbage Tree
Cedar
Cinnamon
Cork
Cotton
Cow Tree, *s*
Cypress
Ebony
Elder
Elm
Fan Palm
Fig Tree
Fringe Tree
Fustic Wood
Hazel
Iron Wood
Ivy
Jasmine
Judas' Tree
Kalmia
Larch
Laurel
Lilac
Lime
Mahogany
Mamee Tree
Maple
Mosses
Mustard
Myrtle
Oak
Palmetto
Palms
Pine
  [The Red Canadian Pine
  The Scrub Pine

    - The True Yellow Pine
    - The Jersey Pine
    - The Pitch Pine
    - The Loblolly Pine
    - The Long-leaved Pine
    - The White Pine
    - The Pinus Flexilis
    - The Pinus Lambertiana
    - The Wild Pine or Scots Fir
    - The Stone Pine, &c.]
  - Pistachia Tree
  - Plane Tree
  - Plantain Tree
  - Poplar
  - Privet
  - Rosewood
  - Sandal Wood
  - Service Tree
  - Silver Tree
  - Snowball Tree
  - Sugar Cane
  - Sycamore
  - Tallow Tree
  - Tamarind Tree
  - Tea
  - Teak Wood
  - Tulip Tree
  - Upas Tree
  - Vine
  - Yew
  - Willow
  - Witch Hazel
- ESCULENT VEGETABLES.
  - Artichoke
  - Coffee
  - Echalote
  - Egg-Plant
  - Endive
  - Fennel
  - French Beans
  - Hop
  - Horseradish
  - Houseleek
  - Lettuce
  - Lentil
  - Liquorice
  - Maize
  - Millet
  - New Zealand Spinage
  - Onion
  - Parsley
  - Parsnip
  - Pea
  - Plantain
  - Potato
  - Sweet Potato
  - Radish
  - Rhubarb
  - Rice
  - Rye
  - Sago, Palm
  - Sago, *s*
  - Sea Kail
  - Sorrel
  - Spinage
  - Thyme
  - Truffle
  - Walnut
  - Water-cress
  - Yam
- SPICES.
  - Allspice
  - Coriander
  - Ginger
  - Hellebore
  - Mint
  - Nutmeg
  - Olive
  - Pepper
  - Sage
  - Samphire
- *Miscellaneous.*
  - Acacia
  - Acanthus
  - Ady
  - Agaric
  - Algæ
  - Alconda
  - Alkanet
  - Aloes
  - Ananas
  - Anda
  - Angelica, *s*
  - Aracatscha
  - Archil
  - Balessan
  - Bamboo Cane
  - Boneset
  - Botany
  - Botanical Gardens
  - Cactus
  - Cassava
  - Cassia
  - Centaury
  - Chamomile, Roman
  - Cicuta
  - Cloree
  - Clover
  - Coca, *s*
  - Colchicum
  - Conia, *s*
  - Cryptogamia
  - Decandria
  - Diœcious
  - Dill-Seed
  - Dionæa Muscipula
  - Dock
  - Dodecandria
  - Dog-Bane
  - Dog-Grass
  - Dogwood
  - Drupe
  - Elicampane
  - Endemic
  - Equisitum
  - Eryngo
  - Eupatorium
  - Exotic
  - Eyebright
  - Ferns
  - Fire Weed
  - Frasera Caroliniensis
  - Fritillaria
  - Fuci
  - Fungi
  - Furze
  - Gentian
  - Ginseng
  - Golden Root
  - Goose-Foot
  - Grasses
  - Groundsel
  - Guava
  - Guiacum
  - Hackberry
  - Hawthorn
  - Heath
  - Hemlock
  - Henbane
  - Henna Plant
  - Herbarium
  - Hickory
  - Honey Locust
  - Hop
  - Horehound
  - Hornbeam
  - Horse Chestnut
  - Hydrangea
  - Ice
  - Plant
  - Juniper
  - Lavender
  - Leontodon Taraxacum
  - Lichens
  - Liquidambar Styraciflua
  - Liverwort
  - Lobelia
  - Locust
  - Madder
  - Mammee
  - Manchineel
  - Mandragora
  - Mango
  - Mangosteen
  - Mangrove
  - Marjoram
  - Medulla
  - Melilot
  - Misletoe
  - Motherwort
  - Moving Plant
  - Muric Acid
  - Mullein
  - Nard
  - Nepenthes
  - Nettle
  - Nightshade
  - Nux Vomica
  - Oleaginous Plants, *s*
  - Papaw
  - Papyrus
  - Parasites
  - Perennial
  - Phytology
  - Pinkneya Pubescens
  - Purslane
  - Quassia
  - Raceme
  - Rafflesia
  - Rape
  - Ratan
  - Rattany
  - Reed
  - Rhododendron Maximum
  - Rocket
  - Rocambole
  - Rosemary
  - Rue
  - Rush Benjamin
  - Saffron
  - Saint Foin
  - Saint John's Bread
  - Saint John's Wort
  - Salsafy
  - Sarracenia
  - Sarsaparilla
  - Saxifrage
  - Scabious
  - Scirpus
  - Scurvy Grass
  - Sedge
  - Seneca Root
  - Sensitive Plant
  - Sesamum Orientale
  - Sessile
  - Shamrock
  - Skunk Cabbage
  - Snake-Root
  - Sphagnum
  - Soap Berry
  - Solomon's Seal
  - Soy
  - Spruce
  - Squill
  - Stramonium
  - Sumach
  - Sweet Flag
  - Tansy
  - Teasel
  - Thistle
  - Timothy Grass
  - Toad Flax
  - Tobacco
  - Tomato
  - Tuberose
  - Tupelo
  - Vegetation
  - Valerian
  - Vallisneria
  - Vervain
  - Vetch
  - Wax-Myrtle
  - Winged
  - Woad
  - Wold
  - Wormwood
  - Yam
  - Yew

Biography.

- BOTANISTS, AND WRITERS ON BOTANY.
  - Allioni, Charles
  - Alston, Charles
  - Bartram, John
  - Bartram, William
  - Blackwell, Alexander and Elizabeth
  - Blair, Patrick
  - Camerarius, Joachim II.
  - Cavanilles, Antonio Joseph
  - Colden, Cadwallader
  - Commelin, John and Caspar
  - Commerson, Philibert
  - Dillenius, John James
  - Forskal, Peter
  - Garden, Alexander
  - Gleditsch, John Theophilus
  - Hænke, Thaddeus
  - Jacquin, Nicholas Joseph
  - Lamarck, Chevalier de
  - Linné, Charles
  - Lobel, Martin de
  - Logan, James
  - Michaux, André
  - Michaux, François André
  - Mutis, Joseph Celestino
  - Thunberg, Charles Peter
  - Tournefort, Joseph Pitton de

MINERAL KINGDOM.

Mineralogy.
- Adamantine Spar
- Agalmatolite
- Agustini
- Alabaster, *s*
- Alum
- Alum Slate
- Alum Stone
- Anthracite
- Anthropolitos
- Antimony
- Asbestos
- Augite
- Axinite
- Beryl
- Bilin
- Bitumen
- Bole
- Brimstone
- Cerium
- Chalcedony
- Chert, *s*
- Chromate of Iron
- Chrome
- Chrysoberyl
- Chrysolite
- Coal
- Cobalt
- Columbite
- Columbium
- Copper
- Corundum
- Crystals
- Datholite
- Dolomite
- Drawing Slate
- Emerald
- Emery
- Epidote
- Fachingen Water
- Febrolite
- Feldspar
- Flint
- Fluor
- Franklinite
- Fulgurite
- Fullers' Earth
- Gadolinite, *s*
- Galena
- Garnet
- Glucina
- Gneiss
- Gold
- Harmotome
- Helvin
- Honey Stone, *s*
- Hornblende
- Hypersthene
- Ichthyolite
- Idocrase
- Iolite
- Iron
- Jet
- Labradorite
- Lapis Lazuli
- Latrobite
- Lazulite
- Lead
- Lime
- Lithia
- Magnesia
- Manganese
- Mellite
- Mercury
- Metal
- Mine
- Mineral Waters
- Molybdenum
- Nephrite
- Nickel
- Olivine
- Opal
- Ores
- Orthite
- Osmium
- Oxahevrite
- Palladium
- Petalite
- Phosphorescence
- Pitchstone
- Platina
- Plumbago
- Polyhalite
- Polymignite
- Prehnite
- Pyrallolite
- Pyrochlore
- Quartz
- Sandstone
- Saussurite
- Sappare
- Scapolite
- Schiller Spar
- Semi Metals
- Serpentine
- Silex
- Silicate of Manganese
- Silver
- Skorodite
- Slate
- Soapstone
- Soda
- Sodalite
- Spinelle
- Stalactites
- Staurotide
- Steel
- Strontites
- Sulphur
- Surturbrand
- Tabular Spar
- Talc
- Tellurium
- Thomsonite
- Thorium
- Tin
- Titianum
- Tourmaline
- Tungsten
- Turnerite
- Turquoise
- Uranium
- Vanadium
- Vauquelinite
- Wagnerite
- Wavellite
- Yenite
- Yttria
- Yttro-Cerite
- Yttro-Tantalite
- Zeolite
- Zinc
  - [Sulphate of Zinc
  - Red Oxide of Zinc
  - Electric Calamine
  - Calamine
  - White Vitriol
  - Uses of Zinc]
- Zircon
- Zirconia

Biography.
- Amoretti, Abbate Carlo
- Swedenborg, Emanuel

III.

MEDICINE AND SURGERY.

MEDICINE.

Diseases.
- Ague
- Anchylosis
- Aneurism, *s*
- Angina Pectoris, *s*
- Apoplexy
- Asclepiades
- Asphyxia
- Asthma
- Atrophy
- Burns, *s*
- Calculus, or Stone
- Cancer
- Cancer, *s*
- Catarrh
- Catalepsy
- Chilblains
- Cholera
- Colic
- Consumption
- Contagion
- Convulsion
- Cough
- Croup
- Diabetes
- Diarrhea
- Diseases, Hereditary
- Dropsy
- Drowning
- Dysentery
- Dyspepsia
- Elephantiasis
- Endemic
- Epidemic
- Epilepsy
- Erotomancy
- Eruption
- Erysipelas
- Fever
  - [Inflammatory
  - Typhus
  - Nervous
  - Dengue
  - Synochus
  - Yellow]
- Gangrene
- Gout
- Home Sickness
- Hooping Cough
- Hemorrhage
- Hemorrhoids
- Hospital Fever
- Hydrophobia
- Hypochondriasis
- Hypochondriasis and Hysteria, *s*
- Hysterics
- Influenza
- Insanity, and *s*
- Jaundice
- Leprosy
- Lycanthropy
- Mal de Naples
- Measles
- Miasma
- Miliary Fever
- Mortification
- Nervous Diseases
- Night Blindness
- Ophthalmia
- Palsy
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- Morveau, Louis Bernard Guyton de Baron
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- Volta, Alessandro

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PREFACE.

The Popular Encyclopedia, now submitted to the public in its completed form, is founded on the celebrated German Encyclopedia, known by the name of 'Conversations Lexicon,' which has gone through a number of editions, and of which translations have appeared in almost every European language. Its more immediate basis, however, is the American edition of that work, translated and edited by Dr Francis Lieber, and published at Philadelphia, in thirteen vols. 8vo.

The 'Conversations Lexicon,' originally a publication of comparatively small size and limited scope, has become, in the course of the various translations and editions through which it has passed, greatly enlarged, and is now remarkable, beyond its other excellencies, for the comprehensive character of the information which it embraces. Besides Germany, almost every other continental state of Europe may be said to have contributed to its contents as they now stand; for each translation of the early editions—whether French, Italian, Danish, Swedish, or Dutch—obtained the benefit of such revision, and such additional information regarding individual countries, as natives of the respective countries could alone bestow; and hence the later impressions of the work, taking advantage of these corrections and additions, display an accuracy and minuteness of knowledge on many historical and political points, which might be looked for in vain in any other single publication.

In bringing out an English Encyclopedia, founded on a work possessing so much to recommend it, and which has long enjoyed a European reputation, little fear was entertained as to its favourable reception; and, indeed, the result, in that respect, has already proved highly satisfactory. But much, it was found, remained to be done, in order to render it equal to the wants, and worthy of the patronage, of a British public. Great additions, in particular, required to be made on subjects connected with the history, biography, and topography of this country; and most of the articles in the arts and sciences, with all their accompanying illustrations, required to be wholly supplied. In this way, at least one third of the work may be considered as entirely new, while the rest has undergone such correction and alteration as a careful revision suggested, or the progress of events demanded.

The Popular Encyclopedia, as will be seen from a very slight inspection, partakes more of the character of a General Dictionary, than belongs to the larger Encyclopedias with which this country is familiar. Instead of the subjects being treated of under certain great heads, so as to form rather a collection of historical and scientific Essays than a work alphabetically arranged for ready reference, they are here placed under their own proper catchwords, so that the reader at a glance may satisfy himself on any particular point of inquiry with the facility with which he may ascertain the meaning of a word in a dictionary. For example: In history, the more eminent sovereigns of Europe are not only noticed under the countries to which they belong, but memoirs of them are given under their own proper names: And, in science, all that relates to Chemistry, Geology, Optics, or the like, is not to be found under these heads alone, but the different branches of each science are separately treated of under the terms by which they are generally distinguished. This peculiarity in the Popular Encyclopedia, while it eminently enhances its utility as a book of reference, may lead some, unacquainted with its character, and taking only a casual survey of its principal articles, to conclude that it is meagre or deficient in its details, even in cases where it would be found, on proper consultation, to be abundantly copious. Indeed, it was a knowledge of such misapprehensions existing in several quarters, that first suggested the necessity of appending to the work an ANALYTICAL INDEX of its various contents. This INDEX, which has been compiled at a great sacrifice of time and labour, will prove, it is hoped, highly serviceable in directing the reader in his inquiries regarding any branch of knowledge treated of in the Encyclopedia. The DISSERTATIONS ON THE RISE AND PROGRESS OF LITERATURE, SCIENCE, AND THE FINE ARTS, which accompany the work, and which add so greatly to its value and to the reputation of their distinguished authors, will still further assist the reader in his researches, inasmuch as they trace, step by step, man's gradual advance in civilization, and give, in one connected view, a summary of what he has accomplished in all that really tends to ennoble the human intellect.

Since the publication of the POPULAR ENCYCLOPEDIA commenced, many changes have taken place in the literary, political, and scientific world. To record these changes, and especially to render the early parts of the Encyclopedia uniform with the later in point of recent information, a SUPPLEMENT has been made to the whole, which embraces, as far as practicable, whatever of importance has occurred, in history or science, within these few years, and which has also furnished an opportunity of making such emendations and additions as have been overlooked or omitted in the body of the work. From the character of its contents, the SUPPLEMENT will doubtless form to a number of readers the most interesting portion of the Encyclopedia. Many of the articles relate to subjects of present moment, and the information they convey is chiefly of a novel nature. The memoirs, in particular, of eminent individuals recently deceased, in which the Supplement abounds, must be the more highly estimated as they are not to be found in any similar work, or have not yet made their way into any biographical dictionary.

In dismissing from his hands a work which has more or less occupied his attention for a period of nearly ten years, the editor has to acknowledge the assistance he received, in the prosecution of his labours, from many gentlemen eminent in the arts and sciences. It would be now difficult to particularise individually all who have contributed to the POPULAR ENCYCLOPEDIA; but of those who have had a considerable share in certain departments of the work, may be mentioned Mr WILLIAM GRIER, author of the Mechanic's Calculator and other popular treatises, who furnished a number of articles on subjects connected with the Useful Arts and Natural Philosophy, and Mr ROBERT CAMPBELL, a young chemist of rising celebrity, who contributed various papers on his own favourite science. Both these gentlemen have been, alas! cut off by death, while yet in the prime of manhood. Most of the long articles in Natural History, and the illustrations connected therewith, are the production of Captain THOMAS BROWN, F.L.S. In the latter portion of the Encyclopedia, particularly in the Supplement, the editor has to acknowledge the valuable assistance of Dr THOMAS ANDREW, in Anatomy; of Dr GREGORY, professor of Medicine in King's College, Aberdeen, in Chemistry; of Mr WILLIAM RHIND, member of the royal college of surgeons, Edinburgh, in Geology; and of Messrs JAMES and GEORGE WHITELAW, in Mechanical Science.

ALEX. WHITELAW.

GLASGOW, 1841.

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